Commonwealth of Pennsylvania

DEPARTMENT OF AGRICULTURE

BULLETIN No. 213

PROCEEDINGS OF THE FARMERS' Annual Normal Institute AND SPRING MEETING State Board of Agriculture

COMPILED BY

A. L. MARTIN, *Director of Institutes*

HELD IN THE COURT HOUSE, LANCASTER, PA.
MAY 23 TO 26, 1911

HARRISBURG:
C. E. AUGHINBAUGH, PRINTER TO THE STATE OF PENNSYLVANIA
1911

SUMMARY OF CONTENTS

Page.
Preface, ... 5
Letter of Transmittal, ... 7
Members State Board of Agriculture, ... 9
Proceedings Spring Meeting Board of Agriculture, ... 13
Report Credential Committee, ... 16
Discussion on Question of Reciprocity, ... 17
Report Committee on Resolutions, ... 26
List of County Chairmen, ... 29
List State Lecturers, ... 31
Program Meeting Farmers' Annual Normal Institute, ... 33
Proceedings Farmers' Annual Normal Institute, ... 36
Address of Welcome, Hon. Frank B. McClain, ... 36
Response to Address of Welcome, Dr. W. T. Phillipy, ... 37
The Production of Sanitary Milk, D. H. Bergey, ... 42
Essentials of Butter Making, Mrs. Jean Kane Foulke, ... 55
What's the Matter with the Pennsylvania Farmer, T. D. Harmon, ... 64
The Country Life Situation, L. H. Bailey, ... 70
Observations on German Agriculture, Dr. Thos. F. Hunt, ... 74
Handling the Fruit Crop, C. J. Tyson, ... 80
A Fortune in Fifteen Years, and Fruit its Factor, Sheldon Funk, ... 88
Horticulture: Past, Present, Future, W. W. Farnsworth, ... 94
General Discussion on Institute Work, ... 106
The Poultry Industry, Dr. James E. Rice, ... 136
Farm Management, J. A. Billings, ... 151
The Needs of our Rural Schools, Miss Sara C. Lovejoy, ... 168
Country Schools for Country Life, Prof. Thos. I. Mairs, ... 173
The Present Trend of Agricultural Education, L. A. Clinton, ... 178
Some Lessons We Should Learn, R. P. Kester, ... 190
Common Diseases of Livestock, Dr. C. J. Marshall, ... 194
Cultivation and Harvesting of Tobacco, Hon. E. K. Hibshman, ... 204
Market Gardening, M. H. McCallum, ... 214
Report of Committee on Resolutions, ... 219
Gleanings from Other Countries, Miss Sara Phillips Thomas, ... 221
Farm Sanitation, Mrs. Geo. E. Monroe, ... 228
A Three Course Dinner, Mrs. Anna B. Scott, ... 232

PREFACE

Commonwealth of Pennsylvania,
Department of Agriculture,

Harrisburg, Pa., July 20, 1911.

There is perhaps no source of information upon subjects relating to either practical or scientific agriculture that is so easily available as the Farmers' Institute, and whatever adds to the efficiency of these institutes is of paramount importance. The hope of increasing their usefulness to the farmers of the State has led to the establishment of what is known as the Farmers' Normal Institute, in which all institute managers and lecturers of the State come together once a year for consultation and instruction.

In order that the instruction given at these institutes may be available to the greatest possible number, this Department publishes in bulletin form their proceedings, and so we send out the following bulletin, No. 213, containing the full proceedings of the Normal Institute held at Lancaster, Pa., May 23-26, 1911, in the hope that it may prove helpful upon the many farms and in the many farmhouses to which it may come.

N. B. CRITCHFIELD,
Secretary of Agriculture.

LETTER OF TRANSMITTAL

Commonwealth of Pennsylvania,
Department of Agriculture,

Harrisburg, Pa., July 18, 1911.

Hon. N. B. Critchfield, Secretary of Agriculture:

Dear Sir: I have the honor to present herewith, bulletin of the Ninth Annual "Farmers' Normal Institute," which was held at Lancaster, Pa., May 23 to 26, 1911.

Very respectfully,
A. L. MARTIN,
Director of Institutes.

MEMBERS

OF THE

PENNSYLVANIA STATE BOARD OF AGRICULTURE

FOR THE YEAR 1911

MEMBERS EX-OFFICIO

HON. JOHN K. TENER, Governor.
HON. HENRY HOUCK, Secretary of Internal Affairs.
DR. N. C. SCHAEFFER, Superintendent of Public Instruction.
DR. EDWIN EARLE SPARKS, President of the State College.
HON. A. E. SISSON, Auditor General.
HON. N. B. CRITCHFIELD, Secretary of Agriculture.

APPOINTED BY THE GOVERNOR

R. I. Young, Middletown, Dauphin County, ...Term expires 1911
R. H. Thomas, Jr., Mechanicsburg, Cumberland County, ...Term expires 1912
Gen. James A. Beaver, Bellefonte, Centre County, ...Term expires 1913

APPOINTED BY THE STATE POULTRY ASSOCIATION

J. D. Nevius ....Philadelphia, ...1910

APPOINTED BY THE PENNSYLVANIA BRANCH OF THE AMERICAN POULTRY ASSOCIATION

W. Theo. Wittman, ... Allentown, ...1913

ELECTED BY COUNTY AGRICULTURAL SOCIETIES

			Term expires.
Adams,	A. I. Weidner,	Areudstville,	1912
Allegheny,	A. J. Purdy,	Imperial, R. F. D. No. 1,	1912
Armstrong,	S. S. Blyholder,	Kelly Station,	1914
Beaver,	A. L. McKibben,	New Sheffield,	1914
Bedford,	Wm. F. Biddle,	Everett, R. F. D.,	1912
Berks,	H. G. McGowan,	Geiger's Mills,	1913
Blair,	W. Frank Beck,	Altoona,	1914
Bradford,	F. D. Kerrick,	Towanda,	1913
Bucks,	B. Frank Wambold,	Sellersville,	1914

			Term expires.
Butler,	W. H. Milliron,	Euclid,	1914
Cambria,	Jas. Westrick,	Patton, R. F. D. No. 2,	1913
Cameron,			
Carbon,			
Centre,	John A. Woodward,	Howard,	1912
Chester,	M. E. Conard,	Westgrove,	1912
Clarion,	J. H. Wilson,	Clarion,	1913
Clearfield,	Peter Gearhart,	Clearfield,	1913
Clinton,	J. A. Herr,	Millhall, R. F. D.,	1914
Columbia,	A. P. Young,	Millville,	1912
Crawford,	J. S. Patton,	Hartstown,	1914
Cumberland,			
Dauphin,	Edward S. Keiper,	Middletown,	1914
Delaware,	E. J. Durnall,	Swarthmore,	1914
Elk,	John M. Witman,	St. Mary's,	1911
Erie,			
Fayette,			
Forest,			
Franklin,	John P. Young,	Marion,	1914
Fulton,	J. L. Patterson,	McConnellsburg,	1913
Greene,	N. M. Biddle,	Carmichaels,	1913
Huntingdon,	Geo. G. Hutchison,	Warrior's Mark,	1912
Indiana,	S. C. George,	West Lebanon,	1913
Jefferson,	Peter B. Cowan,	Brookville,	1913
Juniata,	Matthew Rodgers,	Mexico,	1912
Lackawanna,	Horace Seamans,	Factoryville,	1913
Lancaster,	J. Aldus Herr,	Lancaster,	1914
Lawrence,	Sylvester Shaffer,	New Castle,	1913
Lebanon,	H. C. Snavely,	Cleona,	1913
Lehigh,	P. S. Fenstermaker,	Allentown,	1912
Luzerne,	J. E. Hildebrant,	Dallas, R. F. D.,	1914
Lycoming,	A. J. Kahler,	Hughesville,	1912
McKean,	O. W. Abbey,	Turtle Point,	1913
Mercer,	W. C. Black,	Mercer,,	1914
Mifflin,	M. M. Naginey,	Milroy,	1913
Monroe,	F. S. Brong,	Saylorsburg,	1913
Montgomery,	John H. Schultz,	Norristown,	1914
Montour,	J. Miles Derr,	Milton, R. F. D.,	1913
Northampton,	C. S. Messinger,	Tatamy,	1912
Northumberland,	I. A. Eschbach,	Milton, R. F. D.,	1914
Perry,	A. T. Holman,	Millerstown,	1913
Philadelphia,	David Rust,	Philadelphia,	1913
Pike,			
Potter,			
Schuylkill,	John Shoener,	New Ringgold,	1913
Snyder,			
Somerset,	John C. Weller,	Rockwood,	1914
Sullivan,	E. R. Warburton,	Campbellsville,	1912
Susquehanna,	Frank A. Davies,	Montrose,	1913
Tioga,	Calvin H. DeWitt,	Mansfield,	1914
Union,	J. Newton Glover,	Vicksburg,	1914
Venango,			
Warren,	R. J. Weld,	Sugargrove,	1914
Washington,	D. S. Taylor,	Burgettstown,	1914
Wayne,	Warren E. Perham,	Pleasant Mount,	1914
Westmoreland,	M. P. Shoemaker,	Greensburg,	1913
Wyoming,	D. A. Knuppenburg,	Lake Carey,	1913
York,	G. F. Barnes,	Rossville,	1914

OFFICERS

PRESIDENT

Hon. John K. Tener, Governor,	Harrisburg.

VICE PRESIDENTS

Geo. G. Hutchison,	Warrior's Mark.
A. J. Kahler,	Hughesville.
Peter Gearhart,	Clearfield.

EXECUTIVE COMMITTEE

Dr. M. E. Conard, Chairman,	Westgrove.
Dr. W. Frank Beck,	Altoona.
J. A. Herr,	Millhall R. F. D.
Matthew Rodgers,	Mexico.
F. D. Kerrick,	Towanda.
M. M. Naginey,	Milroy.
D. A. Knuppenburg,	Lake Carey.
R. J. Weld,	Sugargrove.
A. P. Young,	Millville.
N. B. Critchfield, Secretary,	Harrisburg.

ADVISORY COMMITTEE

Matthew Rodgers,	Mexico.
J. A. Herr,	Millhall R. F. D.
M. M. Naginey,	Milroy.
N. B. Critchfield, Secretary,	Harrisburg.

CONSULTING SPECIALISTS

Botanist,	Prof. W. A. Buckhout,	State College.
Pomologist,	Gabriel Hiester,	Harrisburg.
Chemist,	Dr. Wm. Frear,	State College.
Veterinary Surgeon,	Dr. C. J. Marshall,	Harrisburg.
Sanitarian,	Dr. W. H. Banks,	Mifflintown.
Microscopist and Hygienist,	Prof. J. W. Kellogg,	Harrisburg.
Entomologist,	Prof. Franklin Menges,	York.
Ornithologist,	Prof. H. A. Surface,	Harrisburg.
Meteorologist,	E. R. Demain,	Harrisburg.
Mineralogist,	Baird Halberstadt,	Pottsville.
Apiarist,	H. C. Klinger,	Liverpool.
Economic Geologist,	Dr. Isaac A. Harvey,	Lock Haven.
Agricultural Geologist,	W. H. Stout,	Pinegrove.
Forests and Forestry,	Robert Conklin,	Harrisburg.
Feeding Stuffs,	G. G. Hutchison,	Warrior's Mark.

STANDING COMMITTEES

LEGISLATION

Hon. H. G. McGowan, Chairman,	Geiger's Mills.
Hon. H. C. Snavely,	Cleona.
Peter Gearhart,	Clearfield.
Matthew Rodgers,	Mexico.
S. S. Blyholder,	Kelly Station.

CEREALS AND CEREAL CROPS

J. Miles Derr, Chairman,	Milton.

ROADS AND ROAD LAWS

J. C. Weller, Chairman,	Rockwood.

FRUIT AND FRUIT CULTURE

J. P. Young, Chairman,	Marion.

DAIRY AND DAIRY PRODUCTS

Dr. M. E. Conard, Chairman,	Westgrove.

FERTILIZERS

J. H. Schultz, Chairman,	Norristown.

WOOL AND TEXTILE FIBERS

A. L. McKibben, Chairman,	New Sheffield.

LIVESTOCK

A. P. Young, Chairman,	Millville.

POULTRY

W. Theo. Wittman. Chairman,	Allentown.

PROCEEDINGS OF THE SPRING MEETING OF THE PENNSYLVANIA STATE BOARD OF AGRICULTURE, HELD IN THE COURT HOUSE, LANCASTER, PA., May 23, 1911.

Tuesday, May 23, 1911, 9.30 A. M.

Vice President George G. Hutchison in the Chair.

The CHAIRMAN: The first order of business is the roll-call of members. The Secretary will please call the roll.

Secretary Critchfield called the roll, in answer to which the following gentlemen responded to their names:

A. I. Weidner, Adams County; A. J. Purdy, Allegheny County; S. S. Blyholder, Armstrong County; A. L. McKibben, Beaver County; W. Frank Beck, Blair County; F. D. Kerrick, Bradford County; W. H. Milliron, Butler County; John A. Woodward, Centre County; M. E. Conard, Chester County; J. H. Wilson, Clarion County; Peter Gearhart, Clearfield County; J. A. Herr, Clinton County; A. P. Young, Columbia County; John P. Young, Franklin County; J. L. Patterson, Fulton County; George G. Hutchison, Huntingdon County; S. C. George, Indiana County; Matthew Rodgers, Juniata County; Horace Seamans, Lackawanna County; J. Aldus Herr, Lancaster County; A. J. Kahler, Lycoming County; O. W. Abbey, McKean County; M. M. Naginey, Mifflin County; John H. Schultz, Montgomery County; C. S. Messinger, Northampton County; I. A. Eschbach, Northumberland County; John Shoener, Schuylkill County; John C. Weller, Somerset County; Calvin H. DeWitt, Tioga County; J. Newton Glover, Union County; R. J. Weld, Warren County; D. S. Taylor, Washington County; Warren E. Perham, Wayne County and G. F. Barnes, York County.

The SECRETARY: There is a quorum present, Mr. Chairman.

The CHAIRMAN: The next item on the program is the reading of the minutes of our last meeting. The Secretary will please read the minutes.

The Secretary thereupon read the minutes of the last meeting, which were adopted as read.

The CHAIRMAN: Next in order is the appointment of the Committee on Credentials. The Chair will appoint as the Committee on Credentials, Dr. W. Frank Beck, Blair county; Peter Gearhart, Clearfield county; Hon. A. J. Kahler, Lycoming county; J. C. Weller, Somerset county and J. A. Herr, Clinton county.

Anyone having any credentials of election as members of the Board or delegates elected by agricultural societies or otherwise, will please hand them to the Secretary or Dr. Beck, the Chairman of the Committee. The Committee will be excused to retire and pass on the credentials.

Is there any other matter of business that the Board wishes to take up while this Committee is in session. There is no program prepared for this morning's session of the Board and we will have to take up subjects that may be of interest to the Board and in our work. We have with us this morning a gentleman who has been outside of our State and nation for sometime, looking over agriculture in other countries, and I know at this time you will be pleased to look in the face of Dr. Hunt and have him say a word.

DR. HUNT: In response to the invitation of the Chairman, I might say a few words to you this morning in view of the fact that you have nothing else on the program to disturb you, but I do feel, Mr. Chairman, a good deal like a little chameleon. "What has become of that little chameleon Manda had," inquired Rufus. "She done lost that," replied Zek. "She was one day playing with it, putting him on red to see him turn red; putting him on green to see him turn green; putting him on blue to see him turn blue; and then that poor little girl, not satisfied with letting good enough alone, put him on a plaid and he done bust himself trying to make good." So I think if I try to fill up the morning from ten to twelve o'clock I probably would "done bust myself trying to make good." But I am to speak tonight. I promised myself and my wife that when I got back to America I would forget I was ever in Europe; I would not say a word about it. But I found when I got to my office on the 1st of May that Prof. Agee had made a date down here without asking me, because he could not reach me. I have been in such position I could not be very well reached for seven or eight months with anything like business, purposely so.

I will say this to you: That I never understood until I went to Europe how much we owe to our Puritan ancestors. Now, I am not a Puritan myself—far from it—but I never understood until I traveled through Europe how civilization has been affected by the people who landed on Plymouth Rock. We are cleaner bodied, we are cleaner minded, we are more capable because of the traditions which surround us. Why gentlemen, I went into a first-class hotel in Marsailles, and they have a standing advertisement that they have eight bath rooms in that hotel. I wanted to take a bath and they said that the bath room was on the fourth floor and I was on the seventh. Now, of course, bath rooms do not make civilization; but we are cleaner bodied people because of certain conditions, and so I might go on all the way down the line. Why, an unmarried woman took me to task in Freiberg because the hotels in America would not entertain Mr. Gorky, the Russian novelist, who left his wife in Europe and publicly came to this country with another woman; an unmarried woman took me to task for it. I explained to her that it was not a matter of morals with the hotels, but that no hotel dared to take Mr. Gorky when he came to America with another woman, and his wife at home. She said: "I know the woman well; I know the wife. She's a lovely, beautiful woman, and I don't understand your point of view." We have a different point of view because we are Americans, because we have inherited some traditions, some Puritanical traditions. I presume we are quite different, and so it is with the whole question of Sunday observance. Everywhere in Europe around their cathedrals and churches on Sunday you will find markets. You go inside the churches and there may be 3,000 people worshipping and outside 3,000 or 4,000 buying things or interested in all sorts of games. I am not discussing this question from the standpoint of morals. I am pointing out to you the difference in conditions, if you wish to call it that, the different people, the American and the European type.

Now what I am developing this side of the case for is to develop another side. I may have made a mistake all my life. I hope you have not made that mistake—but I have made the mistake of supposing that our prosperity was due to our natural resources; that we were a new country, with fertile lands, and that by virtue of our great natural resources we are a great prosperous country, and some day when we got around to it we would be the same and have the same trouble as Europe. Ladies and gentlemen, I saw land in Europe that has been farmed for 2,000 years that is as fertile as any land in Lancaster county. France to-day has as great agricultural possibilities as any similar area in America that I know anything about, and I have been from the Atlantic to the Pacific, from the Gulf to the Great Lakes, and if there is any one area in the United States that has any greater agricultural possibilities than France I do not know it. What does that mean? It means that what we have to conserve in this country is manhood; that we are a great country because we have a great people.

We are clean bodied, clean minded. We have an able-bodied class of men and women on the farms and in the cities and it is a competition between men and mind and not between lands, in my judgment. I did not believe that until I went to Europe. I went to Europe with a different idea and I came back to believe that that is why we can continue to compete. The only way our children can inherit the earth is by progress. The only way is to keep the people up to the highest civilization. Years ago a consul to Canada was talking to me in New York City about the United States, and he explained that he had to write an official communication while he was consul to Canada, about the people of Canada and the people of the United States. Now he says he wanted to do justice. He said he could easily say the Canadians do so and so but he could not say the United States did so and so, and he could not because he was an American. He is from Argentine, a young man going to college where I was twelve years ago just at the close of the Spanish-American War. I sat with him at the head of the table and there sat a little girl 14 years of age on the left. This little girl had two brothers in the Spanish-American War. They had come back and you can understand how a girl of 14 would consider the question, having had her brothers in the war. And here was this young Argentinian, who spoke the Spanish as well as English, and after he had talked for half an hour, the girl turned to him, and said: "Why, you are a Spaniard." He looked at her, took in the situation at a glance and he said: "I a Spaniard! No; I am an American." And so this man said he had trouble. "I could not say, speaking of the United States people, the Americans. I could say, the Canadians; and so, what did I do? I said the Yankees did so and so." That is the point he made to me which I did not understand then. I do not look upon the United States as a nation. I think of it as a new civilization. Well now it took about ten years for that to soak into my head; but I understand it now. I travelled through these countries of Europe, and the lessons that I learned while in them is, that we are properous, that we are looked up to by the peoples of the world, everyone of them. Some of them frankly say they wish they were born in America. If we are looked up to, it is because we represent the highest type of civilization and highest ability.

The CHAIRMAN: I see the Committee on Credentials has returned. Is the Committee ready to report:

DR. BECK, Chairman of Credential Committee: The Committee on credentials begs leave to report as follows:

REPORT OF THE COMMITTEE ON CREDENTIALS.

The committee on Credentials have examined the credentials of J. G. Colts, of Sullivan county, Wm. F. Biddle, of Bedford county and J. C. Hildebrant, of Luzerne county. We find them in proper form and recommend their election as members of the State Board of Agriculture.

W. FRANK BECK, Chairman.
PETER GEARHART,
A. J. KAHLER,
J. C. WELLER.
J. A. HERR.

The CHAIRMAN: You have heard the report of the Committee on Credentials. What is your pleasure in regard to it.

MR. BLYHOLDER: I move you that the report of the committee be received and these two gentlemen's names entered as members of this body.

MR. WELD: I second the motion.

The motion was put and agreed to.

The CHAIRMAN: Is there any other credentials. Anyone come in since? If they have if they will please hand them to any member of this Committee they will be acted on. Are there any delegates present from any agricultural societies with credentials or wish to be elected?

MR. JOEL HERR: I want to call the attention of the Secretary to the fact that the term of Mr. Warburton, of Sullivan county does not expire until January, 1912. And referring to the election of Mr. Hildebrant, it does not take effect until that time. Mr. Hildebrant is here, however, as the Manager of Farmers' Institutes.

The CHAIRMAN: The next item on the program is Unfinished Business. Has the Board any Unfinished Business? Anything over from the last meeting that is not passed upon?

The SECRETARY: There is nothing carried over.

The CHAIRMAN: The next item is New Business. Is there any New Business? There appears to be none. I see present here with us a gentleman who has been a member of this Board for many years, Col. John A. Woodward. I would like him to come forward and say a word and tell us what he thinks about reciprocity with Canada and how it will affect the farmer.

COL. WOODWARD: Gentlemen, without coming forward I want to say, that I have abandoned the farm, therefore I have no information on the subject of reciprocity.

The CHAIRMAN: Speak on any question you see proper for a few minutes, along agricultural lines that may come to your mind.

COL. WOODWARD: Really, I am without information on this subject I have been reading carefully the opinions on both sides and I am not yet ready to express an opinion of my own. There are too many things needed to be solved yet.

The CHAIRMAN: I hoped to get the Colonel out on some subject that will be a little inspiration in the work, but as the question is before you, have any of you any thoughts on this question? Don't get political. What are your views? How will it affect us? Will it be beneficial to us? Mr. Lighty, what do you think? We will take five minute speeches on it if we get it opened.

MR. LIGHTY: Mr. Chairman, I will have to confess that I did not catch the trend of the discussion.

The CHAIRMAN: The question that I asked is this: Will it be beneficial to the American farmer or the Pennsylvania farmer, this proposed reciprocity with Canada?

MR. LIGHTY: I would beg, Mr. Chairman, to be excused. I have learned from my 25 years' reading of various papers and books, a goodly number of them, that apparently the greatest statesmen wish ditto. I have been unable to fathom the question of tariff and free trade. I, not being a student of political economy at all and only a plain farmer, and never studying political economy but only agriculture in the field could positively not enlighten you along that line and will ask to be excused.

The CHAIRMAN: That answer seems like a lawyer's. I see the Lecturer of the Pennsylvania State Grange has come in. Have you a word to say to the Board. If you don't wish to speak on reciprocity take some other subject, though it seems to be a live wire.

MR. DORSETT: Mr. Chairman, I would answer myself, emphatically no. I cannot see where it will benefit the farmer in the least. I come from a county that is largely engaged in dairying and in raising hay. If I am correctly informed, it costs our farmers from $4.00 to $5.00 per ton to get their hay into the markets of New York. Our friends in Canada can ship their hay by water for one dollar a ton and they can raise the hay in Canada much cheaper than we can. If that be true, I cannot see how it will benefit the farmers of Tioga county, at least where so largely engaged in raising hay.

Now, so far as dairy products are concerned, we are told that Canada does not keep many dairy cows and is not largely engaged in dairying, yet last year they shipped into the United States some 981,000 pounds of butter, paying the duty of 6 cents per pound. Against that, we shipped into Canada something like 60,000 pounds, paying 4 cents. Now, where does that trade benefit the farmers of Pennsylvania? It seems to me that a country so large in scope as Canada, with so small a population as compared with the United States, they would furnish us more material than we would them, because they with their small population will not begin to eat what we in this great country will. And looking from that side, I cannot see how reciprocity will be of any benefit to the farmers either of Pennsylvania or of the United States.

Another thing that kind of puzzled me a little: Up in Canada those little Canucks have shown unusual wisdom in one particular: They have been able to get away, as it were, with the great wheat trust, if you please to call it that. They have built their elevators and have been in a measure able to fix the price of wheat and to control it, while here in the United States, as we all know, the farmers have but little to say about it.

Another thing comes into my mind: Coming down through that great wheat belt there is a great railroad, and I am told—I do not know how true it is—that much of the stock that is owned in that railroad is held by interests in Wall Street. Now, that is an eye-opener to me, and it seems to me that this whole scheme of reciprocity is gotten up in the interest of corporations and not in the interest of the farmer. They tell us that they are doing it in the interest of the consumer; they want to reduce the high cost of living. That is all nonsense. If they wanted to do that why do they retain the duty on flour after it is manufactured? Why not cut that off along with the rest. If they wanted to help the dairyman by reducing the costs of dairy products why didn't they reduce the cost or reduce the duty on bran and let that in free. But they do nothing of the kind. Everything manufactured still retains the duty. In other words everything the farmer wants to buy he must pay the duty on; the things he has to sell the duty is removed.

The CHAIRMAN: Now the question is opened, we are ready to hear from any others who wish to speak on it?

MR. KESTER: I think James G. Blaine gave the definition of reciprocity as the exchange of things we have for things we do not have with other countries. In applying that definition to this proposition I fail to make it fit. I can make nothing more or less out of this proposition than simple free trade. Of course, that appellation would be very obnoxious to those who are endeavoring to put it through—free trade—but after all that is what it is· It is a misnomer to call it reciprocity. If put up to the American people under the proper name of free trade it would go down in short order.

MR. DAVIES: I would like to endorse what Brother Dorsett said: That everything the farmer has to sell would be free, and what he has to buy, like bran, would be charged. They all seem to have a great interest in the farmer and want to do a great deal for the farmer.

MR. GEARHART: I would like to say that I am entirely surprised with the farmers of Pennsylvania, the representatives here this morning, that they are so afraid of this question. It is shocking to me, why you are not ready to stand up for your rights, for your interests. This is certainly one of the most damnable pieces of class legislation that ever was attempted in the United States, and why are we afraid of it. Why, when Governor Tener made an effort to press that public utilities bill, that would curb the corporations of the State, they were to a unit against it. It is laid on the table, they say, for another two years at least. And so all along the line. If this reciprocity affected the manufacturers of this State it would never had gone as far as it has and there would be no special session of Congress to consider it. But here it affects the farmer and the farmer only, unless the lumber interests, and bound to affect him and cannot be otherwise. It is plain, if we are going to sell our product in the free market and buy in the protected one. We should stand up for our rights and if we don't we should take our medicine.

MR. JOEL HERR: As far as I can see this reciprocity act is only in favor of Canada. It looks to me as though it may have been gotten up by New York and Washington interests, and all I have to say is that we do not need legislation for Canada. If Canada wants to come into the United States, let her make application and then we will talk reciprocity and receive her. If their people are not interested and want to belong to our United States, let them paddle their own canoe·

MR. GLOVER: There is a situation of this kind; that the people demand cheaper food products and yet at the same time the statement is made that cheaper products cannot be raised by our farmers. Twenty-eight years ago I was in Minnesota for three months. Last Fall I visited the State again and I was surprised to see the manufacturing and dairy interests in the State of Minnesota. The dairies have sprung up. How the people turned their attention from wheat and corn growing to dairying! The same thing that is true of Minnesota is true of the Northwest and the territories over the line. I have a brother-in-law who is farming in Polk county, Minnesota, been there 24 years, and he has written several articles to the papers in regard to this matter. He claims it will hurt their flax crop wonderfully, the barley crop, the wheat crop and hay.

Another thing: One reason why the interests ask for this is because the Great Northern Railroad, of which James Hill is president, has a number of acres of land up there and as soon as this bill gets through it will help the Great Northern Railroad. It looks to me that this is a bill in the interest of certain interests as opposed to the farmer and I am opposed to it.

MR. CLARK: I reside up in the striking zone where we have thousands and thousands of men pretty near starving. They are not working, and unless they get their troubles settled, we will have thousands, ten thousands of men there for whom there is no work, and what are we going to do with them I know not. But the cry has been, especially in our end of the State, "Living has cost too much." They cannot afford it; they must have something less. I have a brother living in a Western state who says that of late years the farmers have been coming back to their own. For years the farmers of this State have permitted the cities to eat up their farms; eat practically all their farms away; everything was taken off; nothing went back; because of low prices. Now, then, since we are coming back to our own and getting a little what is right and justice, the cities are crying, "Down with high prices," and this sentiment has gone out with such a striking force and has caused such a feeling throughout the nation to-day, that something must be done to meet this great cry.

But in reading this reciprocity act from first to last—I read it over carefully—there is a question in my mind. In the first place, it must be very carefully considered. You know that we have two kinds of tariff—the tariff for revenue and the tariff for protection· The Democratic Party has been called the free trade party. They were not a free trade party. They wanted a tariff for revenue. The Republican Party was called a protective tariff party. They were, and the people, the great majority of the people of this county are in favor of protective tariff. And here is the point. In legislation of this kind the people ought to be taken into consideration, and in this case they have made a drive at the very foundation of the people of this government, the people that own the lands. There is no question about it; not the slightest doubt about it, and as long as the nation will stand up for their highest sources of power that have struck a knife into you, as it were, into our farming interests to-day, what under the heavens can we expect. Now we are sitting still looking on. Who formulated these tariff measures, this reciprocity measure? Who? You fellows up in Canada? You fellows at home? The Lord only knows. It is fixed up and shows up in nice shape. Pass it, a mandatory order goes out. Pass it as it is or get out. If you don't vote for it as it is it will not be accepted. Canada will not accept it. Stand up and vote for it or get out. If you can stand that you can stand most anything.

MR. KAHLER: I think this is a very important question, as already stated; one that the farmers should take more interest in than they apparently do. I want to say right here, if we were asked to give our opinion, my opinion is that it is suicidal to the best interest of the farmer, this reciprocity bill, unless it is passed with some amendments. Our worthy State Lecturer stated that it affected our flour, it effects us everywhere. He might have said meat will be hurt on the hoof, but when it goes to the block there is a special privilege in that. I am in favor of a fair reciprocity bill, but I think this is giving the roast to the ones protected and giving us the bones. I am emphatically opposed to it without amendments.

DEPUTY SECRETARY MARTIN: I am interested in this discussion and it has brought us back to the final proposition and solution of the great project, and that project is devising a plan by which the products of the farm and garden and the orchards may reach the consumer at a fair and reasonable price. Have you looked over that question and considered it, that the man who produces a pound of butter, a gallon of milk, a bushel of potatoes or a bushel of wheat or ton of hay, only gets a little less than 40 per cent. on that dollar. It does occur to me, with all seriousness, my fellow-farmers, that if there is any one thing we have been utterly lacking in during the last two decades, it has been our failure to make a strenuous effort to solve the problem of the distribution of our products, and this question of reciprocity is driving us to the point the more rapidly. By co-operation, by the establishing of headquarters for farmers' products in all the great centers of trade, will be one of the means by which we could counteract the false accusations of our members of Congress and others in the United States who have attributed falsely, that for the want of farmers products and food is the cause of the present high prices; but I tell you in all seriousness the cause of the high price of living to-day is, that more than 50 per cent. of it is consumed by the middlemen and the intelligent producers of this country have got to solve that problem. The dealers of to-day have closed their eyes to wisdom. Now let us take hold of it in the State of Pennsylvania and every other state and see that the products of our farms reach the consumer at a minimum cost. When we have solved that problem we have solved many problems relative to this cost of living and restrictions that place the products of the farm in competition with one of the greatest grass-growing and wheat-growing countries in the world. It is a serious problem that confronts us as consumers and producers.

MR. SCHULTZ: I don't believe there is a farmer here but what is opposed to this bill, this reciprocity, but it will avail nothing if we stay here until doomsday if we don't take action. I thing we should draw up the strongest kind of resolution condemning this bill and send this resolution to the proper places. Let the people know how the farmers of Pennsylvania feel on this matter.

MR. A. P. YOUNG: Mr. Chairman, We have in the West and Northwest a class of farmers who have skinned that magnificent fertile country of its fertility, and now they want to leave it, a great many of them, and cross the border into new fields. They propose to go over there and skim that land and throw their productions in competition with the productions of the land that they have in a manner destroyed. Fertile lands there capable of producing when first cropped 40 to 50 bushels of wheat now produce less than the thin soils of Pennsylvania per acre. Think of it! These same men are going across the border to take the fertility from that new land and throw it in competition with our farms here in the states that they have abandoned and left. It is a mistake. We ought to oppose it with all the power we can raise.

MR. BOND: We may resolute, we may pass a resolution, we may pronounce denunciation of this matter, but what we want now is action. Have we any evidence what we can accomplish by concerted action? I have in mind a little incident less than 24 hours old where compromise failed, where resolution failed, but concerted action produced the results only yesterday afternoon.

DR. CONARD: One of the speakers spoke as though he was much afraid of the term "free trade." Now most of us were brought up to believe in protection; but I think as the years have gone by we come to believe less in this. Just the other night I heard two men arguing and one of them said he had learned something from the older writers, an argument which I had never heard. I want to leave it with you. He said that a high tariff would never stand because it is built on the principle of selfishness. It was a new thought to me and one to remember. I believe it is true. I am not afraid of free trade. I should not object to it particularly; but one thing I do object to and that is free trade upon the products of the farm and protection of the products of the factory and work of the large corporate interests. I would like to ask you this question: If we are not living pretty nearly under free trade for our products and high tariff for the products of those interests?

MR. RANDALL: I would like to say that I think perhaps that we misconceive the idea of the reciprocity when we call it a tariff bill. It is not a tariff bill. It is a reciprocity bill for the purpose of comity between two countries and for the purpose, as proposed by the President, of establishing better feeling between the two countries. As far as the farmer is concerned, it looks like it will injure him to some extent, but I think that we cannot afford to look at it in a selfish way because there are other interests probably as important, not to us but to others, as the agricultural interests to the farmer. Now the President assures us that it is not going to injure the farmers or injure our country, and I think you will agree with me that the President would not want to do anything that would interfere with us. Secretary Wilson says that he does not think that it will injure the farmer to any extent. But if we should denounce the reciprocity bill, we would denounce something outside the farm. You would denounce taking off the tariff on lumber, and I submit to your consideration, gentlemen, whether or not it is necessary to have a cent of tariff on lumber. It is not, because it has come to the position to-day that the farmer won't build a building unless he has to because the hemlock lumber is all sold. I come from a county where hemlock lumber is manufactured, where our Congressman is very much in favor of tariff on lumber, and I had the pleasure of saying to him that I thought it was not necessary, entirely unnecessary, to have a tariff on lumber. How about wood pulp? We are going to take that off with thousands of imports that the President is anxious to have passed. Wood pulp comes into the country with a tariff at the present time and that is the reason the newspaper men raised the price of periodicals throughout the country, because pulp was high. Mr. Martin struck the nail on the head when he said that the middleman ought to be got away from the farmer. That is my idea. Everybody has to admit that the cost of living is too high. Everybody knows that and the fact of it is that it is not because the farmer is getting too much for what he has raised, but because the middlemen or speculators upon the commodity of the farmer make it a burden for the laboring man to live. I don't believe, although I represent the agricultural interests of our end of the State to some extent, that President Taft would do a thing that would be an injury to the farmers of Pennsylvania. I don't believe it. And I know he says himself that they can try it and if it does an injury, why then it can be repealed; but he feels sure in saying that I don't believe that President Taft would do anything to cause a blight upon these agricultural interests of this country.

Now I know that this may not meet the views of a great many people. But you take into consideration that it means a reciprocity treaty and not a tariff bill. I have been a Republican from boyhood to manhood and to mature age and I favor protection, but I want to say to you that we have got to face the fact sooner or later that this high tariff has got to be reduced. Whether you are a Republican or Democrat I do not care but this high tariff must be reduced and we must face the fact just as sure as we stand here. The high tariff cannot always exist. So I say in resoluting upon this reciprocity bill remember that you cannot do it unless you slap the President and cabinet in the face. It has been asked, Who makes the treaties? The people don't make the treaties. The President and cabinet make them and submit them to the Senate, and if confirmed. they become a law. Anybody knows that.

MR. CLARK: You think because of the tariff on lumber the consumer is paying more for his lumber here than he would if the tariff were removed?

MR. RANDALL: No sir; because there are more middlemen in the agricultural lines than anything else I know. This you will notice all over the country the middlemen speculate everywhere on the people of the country. Our men pay 38 cents a pound for butter in the stores. There are not many middlemen in the lumber business. You know that.

A Member: The point in regard to reciprocity all sums up as Brother Kester of Clearfield has stated. When James G. Blaine established reciprocity with other nations it meant something. It was not a wholesale business without any relation to the American people, and when he went to Germany and said: "Give us your potash and we will give you pork," it meant just that much: and when he said to Chili: "Give us your nitrate of soda and we will give you iron products and cotton fabrics." And so we went the world around, giving the nations the commodities we did not use ourselves and we furnished them with the commodities that they did not produce.

In looking at this question as it is to-day in regard to reciprocity with Canada, we find it entirely different. Take up the Grange News and you will find I think on the 2nd page the wholesale list, and it is sufficiently convincing to me that it is a piece of job work. This has been intimated here already by Brother Young: That we have skinned the West. There is no question about that—until these fertile plains that at one time produced from 40 to 60 bushels of wheat to the acre, to-day looking over the agricultural statistics we find only producing 14 bushels now. Somebody is not making a living. Somebody is complaining. We have a right to complain of those very farmers who because they could not get fertilizer without going to the trusts or combination of trusts for it have gone into the great wheat belt of Canada where they can produce nearly 40 to 60 bushels an acre.

How about the transportation? They have a rate from Duluth to Buffalo, a distance of more than a thousand miles, and it only costs 33 cents a ton for the thousand miles. Think of it! It is cheaper to transport wheat on the Great Lakes than it is to keep it in the store houses. How are you going to meet competition under such conditions as that? Read up statistics and learn that men who are representatives in the United States Congress are men directly interested in this great Northern scheme, men who have vast lands there and have gotten these men from the West to go up there, 40,000 a year, where they know they can produce wheat much cheaper than on the American soils which have been depleted. Let Americans be on guard.

MR. KERRICK: I know in Lancaster you are all interested in wheat. I have a nephew of my wife who went over to Canada and purchased some three thousand acres of wheat land and he said to me when this bill passes we can get our wheat to America for 25 cents less on the bushel. That means something to Pennsylvania. I claim this is simply free trade for the farmer and I am utterly opposed to the bill. They can produce potatoes and flour cheaper than we can in this country, up in that cool country. You take the tariff off and it means something still to the farmer. If it is not free trade on the farmer I don't know what it means.

MR. BLYHOLDER: It seems to me that we are almost a unit of the same opinion. I believe that we with James G. Blaine all believe in reciprocity, but I believe that we do not believe in the pretense of reciprocity, and I believe that the bill that is before Congress now is a pretense. It is a pretense to the great laboring classes of this country because they have been crying, as well as we have, for cheaper living, and now they come to them with this sop, pretending that it is going to cheapen the products upon which we live, which any man by examining that bill will see at a glance is not true. It does cheapen the farmer's product but it does not permit them to go to the consumer on that same condition. It holds protection of them to the high prices before they reach the consumer. So that I believe that we are, with James G. Blaine, in favor of true reciprocity, call that free trade or what you please. But over and above that we want fair dealings. If they say to us that President Taft says it won't hurt the farmer we will say back to him it won't hurt the farmer to buy his machines and product he wants to buy from the same man that he has to sell what he produces. Therefore, Mr. Chairman, I thought I would hastily draw up a resolution to meet this little idea I have included; but instead of this I will ask that a committee of five be appointed to formulate the views of this body, because I think we should send to our Congressmen and representatives our views, as we did yesterday. I just hastily scratched this and know it is not what we want, but if I read it perhaps we can get it in proper shape:

"Resolved, That we heartily approve of true reciprocity as defined by James G. Blaine; but that we are emphatically opposed to the bill now in Congress which we believe to be deceptive to the producers and much more so to the consumer in this, that it is a pretense to cheapen food stuffs which is not a fact."

Now, then, Mr. Chairman, I move you that a committee of five be appointed to formulate the view of this body and present them to our Congressmen and Senators.

MR. KERRICK: I second the motion.

The motion was put and agreed to.

The CHAIRMAN: I will appoint on that committee Messrs. Blyholder, Kester, Dorsett, Gearhart and Kerrick.

Now if you gentlemen will just adjourn to the adjacent room and get your resolution and return as quickly as possible, it would hasten the time. We have an hour yet.

Is there any other business while these gentlemen are out?

MR. HULL: I want to look at it from the standpoint of the farmer in Mercer county. The Mercer county farmers' interests lie in the prosperity of the iron manufactories. Up along the Ohio the great storehouses there for iron ore are filled almost to their capacity. Take it down at Sharon, Youngstown and Pittsburg, where the iron ore is manufactured into iron, they cannot do it because the storeyards are already filled with the same stuff that we are filled up with and unmanufactured. Why don't they manufacture it? Because the iron yards and the furnaces in the valleys are filled as full as they can pile them with pig iron unmanufactured. There seems to be practically no call for the manufactured pig iron. The people in the valleys who obtain their livelihood from these furnaces and iron manufacturing establishments are walking the streets for something to do. The farmers who take their products into Sharon, Niles, Youngstown, and all these manufacturing points cannot get paid for the products they take there because the people have no money to pay for it. I know this personally, and in our business of market production we never were carrying so many people who were unable to pay as to-day. Now the manufacturers tell the laborers that if they had the output and the market of Canada that they could supply Canada with her pig iron and with the manufactured products that are manufactured through the East from the products of the iron piled up in these yards. I don't want to be considered as in favor of reciprocity but I think that there may be something in the manufacturing establishments that will come out brighter and better. I am not an old man and I have seen many troubles but the most of them never happened.

The CHAIRMAN: Have any of the members died in the knowledge of the Board since the last meeting? The Secretary says he has no record of any.

Deputy Secretary Martin then announced the program for the opening session of the Annual Normal Farmers Institute at 1.30 o'clock.

He also expressed the regrets of the Governor for his inability to be present at any of the sessions owing to the pressure of work incident to the closing sessions of the Legislature.

The CHAIRMAN: I see the Committee on Resolutions has returned. We will now have their report.

Mr. Blyholder then presented the Report of the Committee on Resolutions as follows:

REPORT OF COMMITTEE APPOINTED TO PREPARE RESOLUTIONS EXPRESSING SENTIMENTS OF THIS BODY ON RECIPROCITY WITH CANADA.

Whereas, We believe in Reciprocity as defined by James G. Blaine, and whereas the present bill now pending in Congress discriminates against the farmer inasmuch as it forces him to sell his products in a free market and to continue to buy on a protected market and is deceptive in its pretense to cheapen the cost of living, both to the producer and consumer, therefore be it

Resolved, By the State Board of Agriculture of Pennsylvania and members of the Normal Institute held in joint session in the City of Lancaster, May 23-26, 1911, that we believe it to be for the best interests of Agriculture in Pennsylvania, that this bill be defeated, and that we ask our Senators and Members of the House of Representatives to use their vote and voice against the bill in its present form.

(Signed.)

S. S. BLYHOLDER, Chairman,
R. P. KESTER, Sec'y,
E. B. DORSETT,
PETER GEARHART,
F. D. KERRICK,
Committee.

The CHAIRMAN: What is your pleasure in regard to this report?

MR. GEARHART: I move the adoption of the Report.

MR. RANDALL: I would just like to state, Mr. Chairman, that I consider that a highly drastic measure to be placed upon the minutes, for the reason which I stated before. As far as the agricultural part is concerned, that is all right and it is expressing the opinion of this convention and I have no doubt it will pass with a whirl, but we want to understand that while we are passing this resolution and protecting the wheat and dairy products and all that has been mentioned by any member that has said a word here this morning we are endorsing a high tariff on 200 other articles mentioned in the reciprocity bill and saying that is all right. We are saying to the President that we want to retain the tariff on wood pulp; we are saying that we want to retain the tariff on hemlock lumber thereby making us pay more for hemlock lumber than we ought to pay; and when you pass this resolution that is just exactly what we say. Not only are we denouncing that which is right the agricultural part of it but we are saying that we endorse 200 other articles that go into the poor man's dinner bucket every day and the farmers ought to take that into consideration. It is the poorman to-day the dinner bucket man that is in trouble and it is not the farmer altogether and when we pass this resolution let us pass it understandingly. Let us say to the President that we want this high tariff on wood pulp and lumber and 200 other articles because wheat and dairy products may suffer. Nobody knows they will. Some may say that they are sure it will hurt others have gone so far as to say that it will not hurt at all. But because it may do it we want this wall across the river.

MR. SHOENER: In regards to the lumber, as I understand the bill the tariff is removed on rough lumber and on finished product the tariff is still on. Will that bring the lumber cheaper to the consumer and make the lumber just that much more profitable?

The CHAIRMAN: Is there any amendment to be offered or any remarks on the resolution? The question is called for. In what manner do you wish to vote?

Members: Rising vote.

The motion to adopt the report of the committee was then put and agreed to.

The CHAIRMAN: Is there any other business before the Board? What is your pleasure?

The SECRETARY: Mr. Chairman before we adjourn I want to express the delight I have had in being here this forenoon and express also the regret that I shall not be able to be with you further. I feel that it is not prudent for the head of a department to be absent from the State Capitol during the closing sessions of the General Assembly. I do not know what call there may be made and so I feel that my duty is there. When this meeting was fixed for this date it was supposed that the General Assembly would have adjourned and that is the reason why the Governor cannot be here and that is the reason why it will be impossible for me to remain during the following sessions of the meeting. I am glad to be here this morning and I hope that you will have a pleasant meeting. I shall think of you after I have returned. I feel interested in your work more deeply than I can express.

MR. BLYHOLDER: I want to make this statement to the representatives here. Now you have passed a set of resolutions and no doubt the newspaper representatives here will have them in their papers so that you can get copies of them. Take copies of these resolutions and send them to your members in Congress so that they will come from you personally from the districts they represent and then they will have some weight.

A Member: I think this bill has passed the House and they should be sent to the Senators.

MR. SHOENER: I would like to suggest that the Secretary of Agriculture send a copy of the resolution to each of our United States Senators.

The CHAIRMAN: Is three any other business before the body. The Secretary has expressed the view that there are a number of us that have to be up at the Legislature to look after the interests entrusted to us. I hope to be with the institute as much as possible, but this is duty, as you people saw yesterday, that you have to be on the job, in looking after appropriations and other things and the laws, the seed bill which is now in conference between the House and Senate, a bill that you endorsed last January at your meeting and was drawn by the Secretary and placed in the hands of Mr. Reel, of Somerset county. This bill has been in the Agricultural Committee and has there been amended and then sent over to the Senate Committe, and there the seed people from all over the United States visited the Capitol and appeared before the Committee, some in favor and some against, and after a lot of deliberation and work the bill then was reported out and passed the Senate with some amendments. It went back to the House for concurrence. The gentlemen who were opposed to certain amendments to the bill asked that the House non-concur and a Committee of Conference was to be appointed. I do not know whether this Committee was appointed yesterday or not. I spoke to the Committee on Agriculture in the Senate and also to two gentlemen in the House who are interested as farmers in the bill, to look after this Committee of Conference. If the Committee of Conference agree why we will have a seed bill. What it will be we cannot tell until after that Conference Committee report, and so we hope that they will agree. There is only one amendment that they seem to be quibbling over at this time and our hope is that they will agree. If they do and the Governor signs it, we will have a very fair bill regulating the sale of seeds such as clover, timothy, alfalfa and other seeds, and we are anxious to get this bill through if possible. And there are other measures to be looked after.

Is there any other business to be brought before this body? If not, we will entertain a motion to adjourn.

MR. TAYLOR: Mr. Chairman, I move we adjourn.

The motion was seconded, put and agreed to.

Whereupon the Board adjourned.

N. B. CRITCHFIELD,
Secretary.

LIST OF COUNTY INSTITUTE MANAGERS FOR THE SEASON OF 1910-11

County	Name and Address of Chairmen
Adams,	A. I. Weidner, Arendtsville.
Allegheny,	A. J. Purdy, Imperial, R. F. D.
Armstrong,	S. S. Blyholder, Kelly Station.
Beaver,	A. L. McKibben, New Sheffield.
Bedford,	D. W. Lee, Bedford.
Berks,	H. G. McGowan, Geiger's Mills
Blair,	H. F. Cox, Bellwood.
Bradford,	F. D. Kerrick, Towanda.
Bucks,	Watson T. Davis, Ivyland.
Butler,	N. F. Bartley, Euclid.
Cambria,	James Westrick, Patton, Pa., R. F. D. No. 2.
Cameron,	W. H. Howard, Emporium
Carbon,	Edw. Leinhard, Mauch Chunk, R. F. D. No. 1.
Centre,	John A. Woodward, Howard.
Chester,	M. E. Conard, Westgrove.
Clarion,	J. H. Wilson, Clarion.
Clearfield,	Peter Gearhart, Clearfield.
Clinton,	Joel A. Herr, Millhall.
Columbia,	A. P. Young, Millville.
Crawford,	J. F. Seavy, Saegerstown.
Cumberland,	T. J. Ferguson, Mechanicsburg.
Dauphin,	Edward S. Keiper, Middletown.
Delaware,	E. J. Durnall, Swarthmore.
Elk,	J. B. Werner, St. Marys.
Erie,	Archie Billings, Edinboro.
Fayette,	T. H. Smith, Dunbar, R. F. D. No. 32.
Forest,	C. A. Randall, Tionesta.
Franklin,	J. P Young, Marion
Fulton,	J. L. Patterson, McConnellsburg.
Greene,	J. W. Stewart, Jefferson.
Huntingdon,	G. G. Hutchison, Warrior's Mark.
Indiana,	S. C. George, West Lebanon.
Jefferson,	Peter B. Cowan, Brookville, R. F. D. No. 4.
Juniata,	Matthew Rodgers, Mexico.
Lackawanna,	Horace Seamans, Factoryville.
Lancaster,	J. Aldus Herr, Lancaster, R. F. D.
	Edward K. Hibshman, Ephrata.
Lawrence,	Sylvester Shaffer, New Castle, R. F. D.
Lebanon,	Edward Shuey, Lickdale.
Lehigh,	P. S. Fenstermaker, Allentown.
Luzerne,	J. E. Hildebrant, Dallas, R. F. D. No. 2.
Lycoming,	A. J. Kahler, Hughesville

McKean,	O. W. Abbey, Turtle Point
Mercer,	Wm C. Black, Mercer.
Mifflin,	M. M. Naginey, Milroy.
Monroe,	F. S. Brong, Saylorsburg.
Montgomery,	H. H. Fetterolf, Collegeville.
Montour,	J Miles Derr, Milton, Pa., R. F. D. No. 1.
Northampton,	C. S. Messinger, Tatamy.
Northumberland,	I. A. Eschbach, Milton, Pa., R. F. D.
Philadelphia,	J. B. Kirkbride, Bustleton.
Perry,	A. T. Holman, Millerstown.
Pike,	B. F. Killam, Paupack.
Potter,	Horace H. Hall, Ellisburg.
Schuylkill,	John Shoener, New Ringgold, R. F. D. No. 1.
Snyder,	John S. Kauffman, Middleburg, R. F. D. No. 1.
Somerset,	J. C. Weller, Rockwood, R. F. D. No. 2.
Susquehanna,	F. A. Davies, Montrose.
Tioga,	E. B. Dorsett, Mansfield.
Union,	J. Newton Glover, Vicksburg.
Venango,	W. A. Crawford, Cooperstown.
Warren,	Geo. A. Woodside, Sugargrove.
Washington,	D. S. Taylor, Burgettstown.
Wayne,	W. E. Perham, Pleasant Mt.
Westmoreland,	M. P. Shoemaker, Greensburg.
Wyoming,	D. A. Knuppenburg, Lake Carey.
York,	G. F. Barnes, Rossville.

LIST OF INSTITUTE LECTURERS FOR SEASON OF 1910-11

Anderson, H. M., New Park, Pa.
Barnitz, Chas. M., Riverside, Pa.
Bond, M. S., Danville, Pa.
Bonsteel, F. E., Bear Lake, Pa.
Borland, Andrew S., State College, Pa.
Bruckart, J. W., Lititz, Pa.
Callahan, E. E., Ferenbaugh, N. Y.
Campbell, J. T., Hartstown, Pa.
Card, Fred W., Sylvania, Pa.
Carter, Miss Arabella, No. 1305 Arch St., Philadelphia, Pa.
Clark, M. N., Claridge, Pa.
Cochel, Prof. W. A., State College, Pa.
Conard, Dr. M. E., Westgrove, Pa.
Cooke, Prof. Wells W., Department of Agriculture, Washington, D. C.
Cornman, Chas. T., Carlisle, Pa.
Cox, John W., New Wilmington, Pa.
Detrich, Dr. J. D., No. 438 Adams Ave., Scranton, Pa.
Dorsett, E. B., Mansfield, Pa.
Drake, W. M. C., Volant, Pa
Eschbach, I. A., Milton, Pa., R. F. D. No. 1.
Evans, H. M., Dillsburg, Pa.
Fassett, F. H., Meshoppen, Pa.
Foulke, Mrs. Jean Kane, West Chester, Pa.
Fulton, H. R., State College, Pa.
Frear, Dr. Wm., State College, Pa.
Funk, Dr. J. H., Boyertown, Pa.
Fox, Cyrus T., Division of Zoology, Harrisburg, Pa.
Funk, Sheldon W., Boyertown, Pa.
Goodling, C. L., State College, Pa.
Gardner, Prof. Frank D., State College, Pa.
Gregg, J. W., State College, Pa.
Hibshman, Edw. K., Ephrata, Pa.
Herr, Joel A., Millhall, Pa.
Hill, W. F., Huntingdon, Pa.
Hull, Geo. E., Transfer, Pa., R. F. D.
Jackson, Prof. Homer T., State College, Pa.
Kahler, A. J., Hughesville, Pa.
Kester, R. P., Grampian, Pa.
Kline, Frank, Spring City, Pa.
Ledy, J. H., Marion, Pa.
Lighty, L. W., East Berlin, Pa.
Lovejoy, Miss Sara C., State College, Pa
Mairs, Prof. T. I., State College, Pa.

McCallum, M. H., Wernersville, Pa.
McCurdy, C. C., Hartstown, Pa.
McDowell, M. S., State College, Pa.
Mackintire, W. H., State College, Pa.
Menges, Prof. Franklin, York, Pa.
Monroe, Mrs. Geo. E., Dryden, N. Y.
Murray, D. K., Liverpool, Pa.
Northup, Henry W., Dalton, Pa., R. F. D.
Owens, Prof. Wm. G., Lewisburg, Pa.
Peachey, J. H., Belleville, Pa.
Philips, T. J., Atglen, Pa.
Phillips, E. L., New Bethlehem, Pa.
Phillipy, Dr. W. T., Carlisle, Pa.
Rich, Chas. H., Woolrich, Pa.
Pillsbury, Prof. J. P., State College, Pa.
Ross, Warren G., State College, Pa.
Seeds, Robt. S., Birmingham, Pa.
Shaw, Prof. Chas. F., State College, Pa.
Stephens, A. Woodward, Mooresburg, Pa.
Stout, W. H., Pinegrove, Pa.
Thomas, Miss Sara Phillips, No. 3413 Race St., Philadelphia, Pa
Van Noy, Leon Otice, Troy, Pa., R. F. D., No. 66.
Wagner, F. J., Harrison City, Pa.
Watts, D. H., Kerrmoor, Pa.
Watts, Prof. R. L., State College, Pa.
Weld, R. J., Sugargrove, Pa.
Wittman, W. Theo., Allentown, Pa.
Woodman, S. Paul, Rushland, Pa.
Zeigler, Mrs. Sara B. F., Duncannon, Pa.

MEETING OF THE FARMERS' ANNUAL NORMAL INSTITUTE

PROGRAM

First Session Convenes Tuesday Afternoon, May 23, 1911.

MR. J. ALDUS HERR, Lancaster, Pa., Chairman.

Call to order 1.30.

Address of Welcome, by Mayor Frank B. McClain, Lancaster, Pa.

Response, by Dr. W. T. Phillipy, Carlisle, Pa.

1. "THE PRODUCTION OF SANITARY MILK."

Prof. D. H. Bergey, University of Pennsylvania, Philadelphia, Pa.

2 "ESSENTIALS OF BUTTER MAKING."

Mrs. Jean Kane Foulke, West Chester, Pa.

Note: Governor Tener will be present and address one or more sessions of the Institute.

Tuesday Evening, May 23, 1911.

DR. M. E. CONARD, Westgrove, Pa., Chairman.

Call to order, 7.30.

1. "WHAT IS THE MATTER WITH PENNSYLVANIA FARMERS."

T. D. Harmon, National Stockman and Farmer, Pittsburg, Pa

2. "THE COUNTRY LIFE SITUATION."

Dr. L. H. Bailey, Director, Experiment Station, Cornell University, Ithaca, N. Y.

3. "ADDRESS."

Dr. Thomas F. Hunt, Dean, Experiment Station, State College, Pa.

Wednesday Morning, May 24, 1911.

MR. J. W. STEWART, Jefferson, Pa., Chairman.

Call to order 9.30.

1. "HANDLING OF THE APPLE CROP."
Chester A. Tyson, Floradale, Pa.

2. "A FORTUNE IN 15 YEARS, AND FRUIT THE FACTOR."
Dr. J. H. Funk, Boyertown, Pa.

3. "HORTICULTURE: PAST, PRESENT AND FUTURE."
W. W. Farnsworth, Waterville, Ohio.

Wednesday Afternoon, May 24, 1911.

MR. G. F. BARNES, Rossville, Pa., Chairman.

Call to order 1.30.

"THIS SESSION WILL BE DEVOTED TO GENERAL DISCUSSION FOR THE DEVELOPMENT OF QUESTIONS RELATING TO THE INSTITUTE WORK THROUGHOUT THE STATE."

Opened by Hon. A. L. Martin, Director of Institutes, Harrisburg, Pa.

Note: It is expected that County Chairmen of Institutes and Lecturers will prepare written questions relating to the improvement of the work.

Wednesday Evening, May 24, 1911.

DR. T. J. FERGUSON, Mechanicsburg, Pa., Chairman.

Call to order 7.30.

1. "THE POULTRY INDUSTRY."
Prof. James E. Rice, in Charge Poultry Husbandry, Cornell University, Ithaca, N. Y.

(Illustrated with lantern slides.)

2. "FARM MANAGEMENT."
Prof. D. A. Brodie, Acting Agriculturist, Bureau of Plant Industry, Dept. of Agriculture, Washington, D. C.

(Illustrated with lantern slides.)

Thursday Morning, May 25, 1911.

B. F. KILLAM, Paupack, Pa., Chairman.

Call to order 9.30.

1. "NEEDS OF RURAL SCHOOLS."
Miss Sara C. Lovejoy, State College, Pa.

2. "SOME LESSONS WE SHOULD TEACH."
R. P. Kester, Grampian, Pa.

3. "THE PRESENT TREND OF AGRICULTURAL EDUCATION."
Prof. L. A. Clinton, Director, Experiment Station, Storrs, Conn.

4. "COUNTRY SCHOOLS FOR FARM LIFE."
Prof. Thos. I. Mairs, State College, Pa.

Thursday Afternoon, May 25, 1911.

J. MILES DERR, Milton, Pa., Chairman.

Call to order 1.30.

1. "COMMON DISEASES OF LIVESTOCK."
Dr. C. J. Marshall, State Veterinarian, Harrisburg, Pa.

2. "CULTIVATION AND HARVESTING OF TOBACCO."
(Illustrated.)
E. K. Hibshman, Ephrata, Pa.

3 "MARKET GARDENING."
M. H. McCallum, Wernersville, Pa.

Thursday Evening, May 25, 1911.

MRS. SARAH B. F. ZEIGLER, Duncannon, Pa., President.

Call to order at 7.30.

1. "GLEANINGS FROM OTHER COUNTRIES."
Miss Sara Phillips Thomas, No. 3413 Race St., Philadelphia, Pa.

2. "FARM SANITATION."
Mrs. Geo. E. Monroe, Dryden, N. Y.

3. "A THREE-COURSE DINNER." (Demonstrated with actual cooking.)
Mrs. Anna B. Scott, Domestic Science Bureau, Philadelphia, Pa.

Friday Morning, May 26, 1911.

HON. H. G. McGOWAN, Geiger's Mills, Pa., Chairman.

Call to order 9.30.

1. "REPORT OF RESOLUTION COMMITTEE."

2. "VISITING POINTS OF INTEREST IN CITY AND COUNTY."

Closing Remarks and Adjournment.

PROCEEDINGS OF THE FARMERS' ANNUAL NORMAL INSTITUTE, HELD IN THE COURT HOUSE, LANCASTER, PA., MAY 23-26, 1911.

Tuesday, May 23, 1911, 1.30 P. M.

Mr. J. Aldus Herr, Lancaster, Lancaster county, Pa., in the Chair.

The CHAIRMAN: Ladies and Gentlemen, it affords me quite a pleasure to preside over the first session of a Farmers' Annual Normal Institute ever held in Lancaster county. This is the first one that has ever been held here, and I hope we will come here again. I have the pleasure now of introducing to you Mayor McClain, of Lancaster, who will welcome you to the town.

ADDRESS OF WELCOME.

By HON. FRANK B. McCLAIN, Lancaster, Pa.

Mr. Chairman: I have come here not to make a speech as you might perhaps expect. I have come here not as a teacher, but as a student to listen and to learn of the great science of agriculture from those competent to instruct in it. There is a little maxim which says, "He who by the plow would drive must either hold themselves or drive." I have neither held nor have I driven, and the information that I possess concerning agriculture, therefore, has not come to me through holding the plow. I have, however, had some experience with a certain branch of agriculture covering a great many years. I refer to the cattle growing and cattle feeding industry. But under existing market conditions, a dissertation upon that subject at this time would mean, in view of the experience I have had as well as some of the gentlemen sitting near me feeding cattle this winter, would be to them a somewhat harrowing tale, I fear.

It would be a superfluity for me to tell a body of intelligent, practical farmers like you that Lancaster county for a good many years has enjoyed the proud distinction of occupying the place of No. 1 among, not only the counties of Pennsylvania, but as well the counties of the United States in the annual value of her farm products. This has been true not so much because of the superior quality of our soil, but we feel because of the superior quality of the people who have tilled the soil. There are fair lands to westward which possess a far richer and deeper loam than does the soil of Lancaster county. It is true that their lands are not peopled so extensively as ours, but it is also true that to them has not been applied the same intensive application of human energy as has been applied to the soil of Lancaster county by its sturdy sons.

One thought suggested to me—it may not be a popular thought with you gentlemen and I may be entirely wrong in my surmise—but it seems to me that in these days the tendency is to run too much to machine farming. After all it is not the number of machines you may use upon the farm, but the character of your soil which produces that crop. It is the personality and the willingness to do work of the farmer. I do not mean to decry the use of these labor saving devices. Many of them in use to-day are very helpful. But I contend that the unlimited use of machinery upon farms has a tendency to instill the idea that crops can be grown and harvests can be gathered without the laying on of hands, without the employment of the tools which Nature intended should be used in conjunction with hers to be the most effective agency in crop production. Criticism is frequently heard that the farmers of Lancaster county are not quite as progressive as farmers of some other sections. This probably is true if the comparison is to be based upon the number and kinds of machinery of every character employed by the Lancaster county farmers, but the comparison becomes ridiculous when the results here are compared with the results achieved by those who criticise Lancaster county. And the reason that we do achieve so in contradistinction to the achievements of farmers in other sections of the country where their soil is as good is because here, as I said before, we think we have intelligent, earnest application of human energy joined with scientific methods· And it is this fact, coupled with the native thrift, that has made the Lancaster county farmer the most prosperous of his kind not only throughout Pennsylvania, not only throughout the United States, but the world over.

Meetings such as you are holding here to-day do much to advance the cause of agriculture. They furnish opportunity for exchange of opinions, presentation of new ideas and the formulation of more effective methods of treating the soil and growing corps. You did wisely in selecting Lancaster for your place of meeting, accessible as it is from all points of the compass. To you who have come here from a distance, I say welcome, and whether you be from near or far I here now extend to you the greetings of welcome to the city of Lancaster.

The CHAIRMAN: The next is the response by Dr. W. T. Phillipy, of Carlisle, Pa.

RESPONSE TO ADDRESS OF WELCOME.

By **DR. W. T. PHILLIPY**, Carlisle, Pa.

Mr. Chairman, Honorable Mayor, Ladies and Gentlemen: I assure you that it affords me a great deal of pleasure to respond in your behalf to the pleasant words of greeting and welcome that have been extended to us as we gather here in our Annual Normal Institute this afternoon. My friends, I know that we feel already that we are welcome in your city of Lancaster and in this great County of Lancaster which is a part of the great Commonwealth that is represented here to-day. I know that we have all heard of Lancaster county. We hear of Lancaster county it does not matter what part of the State we are in. There is always someone will say: "Have you ever been to Lancaster county? Have you ever passed through it? Have you ever had the privilege or opportunity of viewing its rich green fields as you passed down over the Pennsylvania Railroad?" I want to say to you, my friends, and the Honorable Mr. Mayor, that it has been my privilege to be in this county a number of times. I have had the pleasure and privileges of appearing at institutes and I know from the interest that was manifested there and the class of people that we were called upon to talk to at Lancaster county is progressive. Its citizens are awake to the opportunities that are presenting themselves, and they are making the best of these opportunities upon their farms.

My friends, it has been so well said and so much better than I can say it, Lancaster county has been the foremost county not only in this Commonwealth of ours, which we are also proud of to-day, but as well the banner county of the United States in its annual production of farmers' products. I know that you will agree with me, that we were glad to accept the kind invitation to some over here to hold this Normal Institute in this beautiful city. It has been my privilege to visit parts, its colleges, its public schools and some of its great charitable institutions as well as it has been to travel over this county, over its railroads and its trolley system and view these rich and fertile fields of Lancaster county and I know, my friends, before you get away from our meeting that you will have the opportunity, if you have not already had it, of seeing some of the fertile farms that are lying around the City of Lancaster. Now, my friends, I want to plead with our good Mayor this afternoon in your behalf. You know when we get away from home we sometimes may step out of the path that is laid down and I want to plead with you, Mr. Mayor, if any of them may be brought before you, please be easy.

The MAYOR: Please say to the visiting delegates that I have instructed the policemen to show them every consideration.

DR. PHILLIPY: Just last evening, I do not know who would advertise our coming to this city, but I have a good friend from the western end of the State and he came into the City of Lancaster last night. I am not going to tell you his name, but I will tell you he belongs to the "duck" family, and he went into one of the prominent hotels and said to the proprietor: "What are your rates here?" And the proprietor said two dollars and up. And my friend said: "Well, sir, I am an institute lecturer of the State of Pennsylvania." The proprietor said: "I am glad to meet you sir. Then it is two dollars down." Now I suppose that somebody had advertised our coming here, but I hope that there will be nothing more serious than that. I just want to tell you a little incident that happened last evening. We all have a good friend from Pennsylvania and he comes from Allentown, but I am not going to tell his name, but he is a chicken man.

He is recognized all over the State and not only in the State of Pennsylvania but throughout this great country of ours. We were coming up street last night and he met a gentleman who said to him: "My friend, the next time you send me any chickens don't send me any of your airoplane kind." Well, I thought that was something new, and I waited for developments. And my friend said: "What do you mean?" And the gentleman said: "The last chickens you sent me were all wings and machinery and there was no meat on them." I hope he will get through this week without arrest or anything of that kind. But my friends, you have heard and you all enjoyed the address of welcome that our good friend has extended to us, and we are here this week to enjoy the instruction that will be given to us in the different sections of this institute and I feel that it would be folly for me to waste my words this afternoon in trying to say anything further; but I want to say in behalf of our friends who have assembled here, Mr. Mayor, that we thank you very kindly for the warm and hearty welcome that you have extended to us during this meeting, and I hope that we all, one and all will be able to say when we go away from here that we have had not only a profitable week but a week of pleasure and you will not be afraid or ashamed to ask us back sometime in the future.

The CHAIRMAN: This will be followed by a roll-call of County Institute Managers and then a roll-call of Institute Lecturers.

The results of these roll-calls and subsequent registrations were as follows:

COUNTY INSTITUTE MANAGERS PRESENT.

County.	Name and Address of Chairman.
Adams	A. I. Weidner, Arendtsville.
Allegheny,	A. J. Purdy, Imperial.
Armstrong	S. S. Blyholder, Kelly Station.
Berks,	H. G. McGowan, Geiger's Mills.
Blair,	Dr. W. Frank Beck, Altoona.
Bradford,	F. D. Kerrick, Towanda.
Bucks,	Watson T. Davis, Ivyland.
Butler,	W. H. Milliron, Euclid.
Carbon,	Edw. Leinhard, Mauch Chunk.
Centre,	John A. Woodward, Howard.
Chester,	M. E. Conard, Westgrove.
Clarion,	J. H. Wilson, Clarion.
Clearfield,	Peter Gearhart, Clearfield.
Clinton,	Joel A. Herr, Millhall.
Columbia,	A. P. Young, Millville.
Crawford,	J. S. Patton, Hartstown.
Elk,	John G. Schmidt, St. Marys.
Erie,	Archie Billings, Edinboro.
Fayette,	T. H. Smith, Dunbar.

Forest,	C. A. Randall, Tionesta.
Franklin,	J. P. Young, Marion.
Fulton,	J. L. Patterson, McConnellsburg.
Greene,	J. W. Stewart, Jefferson.
Huntingdon,	G. G. Hutchison, Warrior's Mark.
Indiana,	S. C. George, West Lebanon.
Juniata,	Matthew Rodgers, Mexico.
Lackawanna,	Horace Seamans, Factoryville.
Lancaster,	J. Aldus Herr, Lancaster.
	Edward K. Hibshman, Ephrata.
Lawrence,	Sylvester Shaffer, New Castle.
Lebanon,	Edward Shuey, Lickdale.
Luzerne,	J. E. Hildebrant, Dallas.
Lycoming,	A. J. Kahler, Hughesville.
McKean,	O. W. Abbey, Turtle Point.
Mifflin,	M. M. Naginey, Milroy.
Monroe,	F. S. Brong, Saylorsburg.
Montgomery,	J. H. Schultz, Norristown.
Montour,	J. Miles Derr, Milton.
Northampton,	C. S. Messinger, Tatamy.
Northumberland,	I. A. Eschbach, Milton.
Philadelphia,	J. B. Kirkbride, Bustleton.
Perry,	A. T. Holman, Millerstown.
Pike,	B. F. Killam, Paupack.
Schuylkill,	John Shoener, New Ringgold.
Somerset,	J. C. Weller, Rockwood.
Tioga,	E. B. Dorsett, Mansfield.
	Calvin H. Dewitt, Mansfield.
Union,	J. Newton Glover, Vicksburg.
Venango,	W. A. Crawford, Cooperstown.
Warren,	Geo. A. Woodside, Sugargrove.
Washington,	D. S. Taylor, Burgettstown.
Wayne,	W. E. Perham, Pleasant Mount.
York,	G. F. Barnes, Rossville.

INSTITUTE LECTURERS PRESENT.

Barnitz, Chas. M., Riverside, Pa.
Bond, M. S., Danville, Pa.
Bonsteel, F. E., Bear Lake, Pa.
Borland, Andrew S., State College, Pa.
Bruckhart, J. W., Lititz, Pa.
Campbell, J. T., Hartstown, Pa.

Card, Fred. W., Sylvania, Pa.
Carter, Miss Arabella, Philadelphia, Pa.
Clark, M. N., Claridge, Pa.
Cochel, Prof. W. A., State College, Pa.
Conard, Dr. M. E., Westgrove, Pa.
Cooke, Prof. Wells W., Dept. of Agriculture, Washington, D. C.
Cornman, Chas. T., Carlisle, Pa.
Dorsett, E. B., Mansfield, Pa.
Drake, W. M. C., Volant, Pa.
Eschbach, I. A., Milton, Pa.
Fassett, F. H., Meshoppen, Pa.
Foulke, Mrs. Jean Kane, West Chester, Pa.
Frear, Dr. Wm., State College, Pa.
Funk, Sheldon W., Boyertown, Pa.
Hibshman, Edw. K., Ephrata, Pa.
Herr, Joel A., Millhall, Pa.
Hull, Geo. E., Transfer, Pa.
Kahler, A. J., Hughesville, Pa.
Kester, R. P., Grampian, Pa.
Lighty, L. W., East Berlin, Pa.
Lovejoy, Miss Sara C., State College, Pa
Mairs, Prof. T. I., Etate College, Pa.
McCallum, M. H., Wernersville, Pa.
McCurdy, C. C., Hartstown, Pa.
McDowell, M. S., State College, Pa.
Menges, Prof. Franklin, York, Pa.
Monroe, Mrs. Geo. E., Dryden, N. Y.
Northup, Henry W., Dalton, Pa.
Peachey, J. H., Belleville, Pa.
Philips, T. J., Atglen, Pa.
Phillips, E. L., New Bethlehem, Pa.
Phillipy, Dr. W. T., Carlisle, Pa.
Rich, Chas. H., Woolrich, Pa.
Ross, Warren G., State College, Pa.
Seeds, Robt. S., Birmingham, Pa.
Stephens, A. Woodward, Mooresburg, Pa.
Stout, W. H., Pinegrove, Pa.
Thomas, Miss Sara Phillips, Philadelphia, Pa.
Van Noy, Leon Otice, Troy, Pa.
Wagner, F. J., Harrison City, Pa.
Watts, D. H., Kerrmoor, Pa.
Weld, R. J., Sugargrove, Pa.
Wittman, W. Theo., Allentown, Pa.
Woodman, S. Paul, Rushland, Pa.
Zeigler, Mrs. Sara B. F., Duncannon Pa

DEPUTY SECRETARY MARTIN: In addition to these roll-calls, members representing all farmers' organizations, farmers' clubs, unions, granges, all kindred organizations, horticultural societies of various kinds are welcome to these meetings and have the privilege of the floor. There is not much voting here and that is the only thing you would be excluded from. If there are representatives of any of the societies named or any other societies representing agriculture present please hold up your hands so that we get your name on the register. From time to time will the members of this institute see to it that our secretary gets a list of those people who will no doubt come in at subsequent sessions of this institute in order that we may procure a complete list of attendants.

The CHAIRMAN: We will now proceed with the regular program. The first will an address on "The Production of Sanitary Milk" by Prof. D. H. Bergey of the University of Pennsylvania, Philadelphia. We had hoped at this time that the Board of Health of Lancaster would be here. Here is their opportunity. I now have the pleasure of introducing to you Prof. Bergey.

PROF. BERGEY: I wish to state before beginning my address that I am not a dairyman; I am not a milkman, nor a farmer. I was born and raised on the farm. I have been a user of milk and I have examined milk in the laboratory for a number of years, so that I feel that I have some knowledge of the sanitary production of milk.

Prof. Bergey then delivered his address as follows:

THE PRODUCTION OF SANITARY MILK·

By D. H. BERGEY, M. D., *University of Pennsylvania.*

By sanitary milk we understand a milk that is free from extraneous things of whatever kind that may affect the health of those using it. The production of sanitary milk is not a difficult matter at all, although it requires constant vigilance on the part of the producer and attention to a great many details. Bacteria are found in the milk ducts of most cows and, subsequently, it is impossible to obtain considerable quantities of milk without the admixture of bacteria. The bacteria in the milk ducts of apparently healthy cows are principally those who are concerned in the natural souring of milk. These bacteria are, therefore, regarded as normal constitutents of milk.

The most common organism found in freshly drawn milk is micrococcus lacticus. In many of its characters this bacteria resembles micrococcus aureous, which is the most frequent cause of pus formation in man and domestic animals. Another organism found in freshly drawn milk is streptococcus lacticus. This bacterium is not easily distinguishable from streptococcus pyogenes, another of the bacteria causing pus formation. These two organisms found in the milk sinews of apparently healthy cows appear, from the effects which they produce in milk, to be normal inhabitants of this portion of the cow's udder and, therefore, have no hygienic significance.

Milk may be said to be contaminated with bacteria when it contains organisms which differ from those mentioned. The contaminating bacteria may be derived from a variety of sources. The principal sources of contamination of milk in the course of production and marketing are to be sought in the dairy itself. The chief sources of contamination are the cow from which the milk is obtained; the stable; the bedding; the fodder; the milker or the utensils in which the milk is collected.

The cow may be the source from which contaminating organisms are derived and these organisms may gain access to the milk because the animal is ill and the bacteria causing the disease are given off with the milk; or second, the contamination may be derived from the fur of the cow or from a dirty udder.

Cows do not suffer from many diseases to which human beings are also liable. The principal diseases that may be disseminated from the cow to the consumer through the milk are the various types of inflammation of the udder giving rise to disturbances of the digestive organs in those using the milk; tuberculosis; foot and mouth diease; and very exceptionally diphtheria and anthrax. Cows suffering from tuberculosis usually give off considerable numbers of the tubercle bacillus, even though the disease is located in some other part of the animal's body than the udder.

The controversy which has continued for some years as to whether tuberculosis of cows is transmissible to human beings remains unsettled. In 1901 Koch contended that bovine tuberculosis was not transmissible to man. Since then there have been so many cases of tuberculosis, especially in children, in which the bovine variety of the tubercle bacillus was found, that it appears wise to regard the bovine type of the disease as a distinct menace to man. Foot-and-mouth-disease is transmissible to man through the milk. As we have not yet discovered the causative agent of this disease, we cannot make any definite statements concerning its transmission to man. There is abundant circumstantial evidence in support of the opinion that diphtheria may be disseminated through milk. Usually the milk is found to have been contaminated by persons who suffer from a mild form of this disease, or who are in intimate contact with cases. Klein, of England, has long contended that cows may suffer from diphtheritic infection with lesions on the udder. However, it has remained for Dean and Todd to show definitely that this form of infection in cows is possibble, and that those who consume the milk in an uncooked state are liable to contract the disease. Anthrax is a highly infectious disease and there is a possibility of its transmission to man through the use of milk. There are no authentic cases of such transmission on record, but every precaution should be taken to exclude the milk of infected dairies.

The bacteria derived from the fur of the cow or from a dirty udder are principally those found in the excrement of the animal. These bacteria cause decomposition and putrefaction of the milk, and, in this way, render it unfit for consumption, or, at least, change its character to such an extent as to make it dangerous to the consumer.

The contamination of milk through bacteria derived from the fur of the animal and from the udder could be obviated to a considerable degree by careful attention to cleanliness of the cow. Currying and brushing the cows serves to remove adherent filth and loose hair. The cows should be cleaned some time before milking is begun in order to allow the dust to settle. Washing the udder and flanks of the cow previous to milking aids in reducing the number of bacteria that may be dislodged and gain access to the milk. While in a moistened state bacteria are not distributed very freely. It is only when the fur of the animal is dry that the bacteria are easily dislodged.

The stable is an important source of contamination of the milk and is a factor which has by no means received the attention which it merits. The type of barn found on many farms does not make it possible to stable cattle under the very best conditions. The amount of space allotted to each animal is insufficient to provide the requisite amount of ventilation· A human being requires about three thousand cubic feet of fresh air per hour and, in order to supply this amount of fresh air in dwellings, about one thousand cubic feet of space should be allotted to each individual. The cow is a much larger animal and requires proportionately larger quantities of fresh air. In the main it may be stated that a cow requires at least a quantity of fresh air equal to that needed by an average person; and, in order that this amount of fresh air may be supplied regularly without the production of drafts, the amount of space allotted to a cow should be, in proportion to her size, one thousand to twelve hundred cubic feet. Many of the stables in older barns are too low to make it possible to bring about satisfactory ventilation, though an undue height of stable is also undesirable. It may be stated that a height of ten to twelve feet is a fair average.

With proper allotment of space and satisfactory provision for ventilation in stables, the purity of the air can be more readily maintained; and where pure air prevails one of the principal sources of contamination in the stable, that is, dust, can be largely eliminated, because the smaller the stable and the greater the overcrowding, the greater the amount of dust floating in the air, and this dust finds its way into the milk during the process of milking.

The dust of stables is a fruitful source of bacteria which cause decomposition and putrefaction in milk. The dust particles and the bacteria adherent to them are derived from the cows, the bedding, the fodder, and the attendants. For this reason, the nature of the bedding and the time of feeding play an important part in the production of sanitary milk. Straw bedding contains a greater number of bacteria than do peat or shavings.

The handling of fodder during the time of milking disseminates large quantities of dust, a considerable portion of which finds its way into the milk, and, for this reason, it is customary to recommend that feeding time and milking time should be separated so as to avoid as much as possible this source of contamination. The nature of the bacteria derived from fodder is similar to that of the bacteria derived from bedding.

The following table, compiled from the experiments of Backhaus of Konigsberg, will show the possible sources of contamination at a glance:

TABLE I.

Elements of Contamination.	Sources of Contamination.	Bacteria.
1. Infection,	Fresh milk,	6,660 per c. c.
	After passage through six vessels,	97,600 per c. c.
2. Bodily cleanliness,	Milk from clean cow,	20,600 per c. c.
	Milk from dirty cow,	170,000 per c. c.
3. Litter,	Peat,	2,000,000 per gm.
	Good straw,	7,500,000 per gm.
	Bad straw,	10,000,000 per gm.
4. Influence of the litter on the number of bacteria in milk.	With peat litter,	3,500 per c. c.
	With straw litter,	7,330 per c. c.
5. Food (dust of, in the byre),	Oil cake,	457,500 per gm.
	Bran,	1,361,000 per gm.
6. Milking,	Milked dry,	5,600 per c. c.
	Milked wet,	9,000 per c. c.
	First milk,	10,400 per c. c.
	Last milk,	Sterile.
	Washed udder,	2,200 per c. c.
	Unwashed udder,	3,800 per c. c.
7. Vessels,	Enamelled vessel,	1,105 per c. c.
	Tin vessel,	1,690 psr c. c.
	Wooden vessel,	279,000 per c. c.
8. Cleaning of vessels,	Sherilized pail,	1,300 per c. c.
	Simply rinsed,	28,600 per c. c.

The milker is undoubtedly a source of contamination, especially so if wet milking is permitted. However, the clothing of the milker, if not clean, is also a source of contamination. Strict cleanliness of the hands of the milker and of his clothing will help to eliminate an important source of contamination. The milker may also contribute disease producting bacteria if he is suffering from some of the communicable diseases, or if he has been in attendance on persons suffering from such diseases. The diseases which may be communicated by the milker are: tuberculosis, diphtheria, scarlet fever, and typhoid fever. No one suffering from, or associating with, persons suffering from any of these diseases should be permitted to take part in the production of milk.

Dirty utensils are also a fruitful source of contamination, and it is quite a task to keep the milking utensils in proper condition of cleanliness to prevent this kind of contamination. Utensils that have been cleaned with soap and hot water, or some other reliable cleansing material, and then scalded, are relatively free from bacteria which are injurious to the milk . They can be made absolutely free from bacteria by subjecting them to a sterilizing process.

The following tables give some indication of the extent to which bacteria are contributed to normal milk during ordinary procedures, especially where the milk is strained and cooled through apparatus that is not sterilized:

TABLE II.

Bacteriological Examination of Milk Derived From Separate Cows in Ordinary Dairies; Samples Collected at Various Stages of the Process of Milking and Cooling.

No.	Udder.	Bucket.	Strainer.	Cooler.	Can.	Bottler.
1,	100	350	23,650	120,400	----------	----------
2,	25	1,250	21,225	508,200	----------	----------
3,	0	75	----------	----------	4,050	----------
4,	0	325	----------	16,200	----------	----------
5,	400	850	60,900	34,550	173,600	84,000

TABLE III.

Influence of Unclean Apparatus Upon the Bacteria Content of Milk.

Dairy No.	Straining Apparatus.			Cooling Apparatus.		
	Beginning.	50 quarts.	100 quarts.	Beginning.	50 quarts.	100 quarts.
1,	21,225	12,800	1,375	508,200	21,700	2,600
2,	4,200	1,685	----------	15,950	2,900	----------
3,	14,925	12,325	----------	1,700	8,800	----------

The type of milk pail employed in milking is also a matter of importance. Several types of pail are in common use and I have had no personal experience in testing their efficiency; but those who have studied this question are generally agreed that some form of pail with the top partly covered in is much better than the old type of pail which is open. The pail with visor used in the dairy department of Cornell University serves the purpose of limiting the amount of dust falling in the milk. The shape and size of the visor has been slightly changed by Professor Harding of Geneva.

The milk should be cooled as soon as possible and kept at a low temperature (about 50 degrees Fahrenheit) until consumed. At a low temperature the bacteria in the milk do not multiply rapidly, but at higher temperatures they multiply quickly; for instance, at the body temperature, a single organism may produce as many as 200 in three hours; 10,000 in six hours; 10,0000,000 in nine hours, and 2,000,000,000 in eighteen hours. Conn has shown that at 50 degrees Fahrenheit bacteria multiply five times in twenty-four hours, while at 70 degrees Fahrenheit, they multiply seven hundred and fifty times.

These bacteria develop at the expense of the chemical constitutents of the milk and produce alterations in the character of the milk far in excess of what is indicated by the mere increase in numbers. In order to keep the number of bacteria as low as possible, milk must be shipped in refrigerator cars, or packed in ice.

Sanitary milk, it will be seen from what has already been said, is simply clean milk obtained from healthy cows and maintained under proper hygienic conditions. Sanitary milk cannot be produced in unsanitary dairies, and, even though it may be in a sanitary condition when collected, if not marketed under proper conditions it will not reach the consumer in a satisfactory state.

It will be necessary, therefore, in order that the consumer may be supplied with sanitary milk, that extreme precautionary measures be carried out not only on the farm in collecting the milk but that the measures be extended all along the line from the farm to the consumer, so that milk that is in a satisfactory condition as collected may maintain that state until it is to be used. It is an encouraging fact that recently transportation companies have announced that they are ready to supply refrigerator cars for the transportation of milk, and through this means it will be possible to allay a great deal of the criticism of the methods employed in conducting dairies that should have been directed against methods of transportation.

The CHAIRMAN: We will now give a few minutes to the discussion of the question· It matters not whether it be a member or not. Please do not forget that it is the discussion of the subjects that makes the meeting. We will be glad to have you ask the Professor any questions bearing on the subject.

DEPUTY SECRETARY MARTIN: You spoke of the cleansing of dairy utensils. What would you regard as a most economical and practical method to be adopted by dairymen for cleansing the dairy vessels?

PROF. BERGEY: Any bacteriologist will view cleanness in a different light from what ordinary people view it. When I spoke of clean vessels, of course, I have in mind vessels which contain no bacteria. Now that is out of the question for the ordinary dairyman. He is not equipped with apparatus that will enable him or permit him to sterilize his vessels. The ordinary method used in washing with soap and water and scalding with boiling water will reduce enormously the number of bacteria that will subsequently appear otherwise. If allowed to dry and drain in such a way that dust will not fall into them it will be a satisfactory condition and yield a milk that will be free from at least an unreasonable dirt and these extraneous bacteria.

A Member: Do you say that it is possible to destroy the entire bacteria?

PROF. BERGEY: Oh, no; I would not convey that idea at all. Our cleaning methods as employed in wholesale places removes a great many of the bacteria but don't by any means destroy all of them.

A Member: But the most approved methods, with the most approved conditions of equipment, will that method destroy all?

PROF. BERGEY: Where you sterilize, of course, you restroy all the bacteria.

A Member: Would that be costly?

PROF. BERGEY: Yes, it would be costly.

A Member: How, with steam?

PROF. BERGEY: Put the steam into the vessels, the steam is turned into the chamber and retained there. That means you have to have a boiler; but very good milk can be produced without going to that expense, sanitary milk, according to my idea.

A Member: Is it possible for ordinary tuberculosis to enter the milk duct, or tuberculosis of the bone to enter the milk duct?

PROF. BERGEY: As I understand it the ordinary tuberculosis of a cow or bone tuberculosis of a cow would mean that that cow would give off tuberculin with the milk. That is the meaning you have in mind? It has been found by bacterial studies of milk that in tuberculosis in remote parts of the body tubercular bacteria can be admitted to the milk without lesion of the udder. Whether this is commonly the case we cannot say but it is believed possible and any animal with tuberculosis should be regarded as a course of danger no matter in what part of the body the lesions may be located.

A Member: At what temperature will the bacteria stop multiplying in the milk?

PROF. BERGEY: Some continue to multiply as low as freezing point. You get a few that multiply at a point as low as freezing. Prof. Conn made a study of the rate of multiplying of bacteria at different temperatures and two tests stand out very prominent as indicating how rapidly they grow. At 50 degrees he found that bacteria multiplied seven times in 24 hours; at 70 degrees Fahrenheit, 750 times in 24 hours. So if you bring the temperature of milk down to 50 degrees, the requirement of some of the large cities, you limit the rate of multiplication enormously. You don't overcome it altogether because they will go on and multiply slightly. The higher the temperature up to a certain point the more rapid the rate of multiplication.

A Member: How about smallpox?

PROF. BERGEY: We don't know anything about the cause of smallpox. We cannot cultivate the organisms of smallpox. We believe it to be transmitted through milk if the milk is in contact with people having smallpox, by the germs getting access to the milk, but we cannot recover from the milk.

DR. CONARD: Have you the rate of multiplication of bacteria in your mind?

PROF. BERGEY: Prof. Conn, of Middletown, Conn., found that at 50 degrees bacteria multiplied 7 times in 24 hours; at 70 degrees Fahrenheit, at the rate of 750 times in 24 hours.

The CHAIRMAN: I would like to ask you a question. The milk that comes to Lancaster is shipped by trolley and comes probably a distance of 4, 8, 10 or 12 miles. What conditions ought we have or ought the producer have to produce what you would call sanitary milk? What condition about his stable before it leaves the farm? That is the part that we are interested in. There is a movement, as I understand it, to get better milk to Lancaster and we as producers wish to meet that if it is reasonable. How are we to meet it?

PROF. BERGEY: The conditions on the dairy farm, of course, will influence very largely the character of the milk coming from that farm. Taking for granted that the milk is obtained from healthy cows, the surroundings in the stable and in the milkhouse will influence the number of bacteria getting access to the milk. If the stable is dirty, if the cows are dirty, then, of course, that milk is bound to have large numbers of bacteria immediately after it is withdrawn from the cow.

The CHAIRMAN: We understand that part, but what are we to do? How are we to get at it?

PROF. BERGEY: That is a question that I hardly think I am capable of answering. I would suggest if possible that the farmer would be educated to the point to see that it would be an advantage to him to have the proper degree of cleanness on his place. If a man exercises greater care, if he expends a little more money than his neighbor and produces a better product he should be paid a better price; and I think that you can educate the farmer to the point that he will be in a position to demand a better price and will be willing to take that extra care, if he knows how. If he does not know how, there are places to learn how to manage his dairy in such a way that he can keep down these sources of contamination in his milk. Just how to manage it I hardly think I am capable of answering.

A Member: Are the people of Philadelphia willing to pay the price if we go to the expense to produce better milk?

PROF. BERGEY: I think the men who will furnish certified milk will find a very ready market. They are hardly able to meet the demand. I think the demand for a first class clean milk can be created by clean milk and will constantly increase. The people are being educated in Philadelphia to that point. We are having a milk exhibit in Philadelphia. We are holding a dairy exhibit in Philadelphia during this week and I feel sure that that will stimulate the demand for clean milk.

A Member: You say the railroads are putting on refrigerator cars.

PROF. BERGEY: I say it is announced that they are ready to supply them.

A Member: They are demanding more freight, putting on the farmer all the toll. As soon as you say higher prices for milk, it is a point they are trying to squeeze the poor man. You want the farmer to go to work and make more expense in stabling and help to produce the milk and pay for it to go there and they are not willing to pay the price.

PROF. BERGEY: I think this agitation and education we are having in Philadelphia will help to bring the newspapers over to the farmer's side. I think the great majority of the intelligent public will see that the farmer's demand for higher prices is a just one if he goes to that expense to produce good milk.

A Member: It is just these articles in the newspaper that are hurting the farmer, demanding better milk and not willing to pay the extra cost of producing it. They are squeezing the poor man out of his milk.

PROF. BERGEY: I think the time is coming when it will be changed. I feel sure that this educational meeting we are having will be a benefit not only to the people of Philadelphia in getting a better milk supply, but makes it possible to charge a greater price for a satisfactory milk.

A Member: I would like to ask if the average farmer producing milk will wash his pail night and morning and in the morning turn them up so that they will drain out and turn them to a window to the south and allow the sunlight to shine in the window on them, will that sterilize them?

PROF. BERGEY: That will go far towards sterilizing the pail. Exposure to direct sunlight kills bacteria very quickly. Ten or fifteen minutes exposure will kill many bacteria.

A Member: Will that go as far as scalding hot water?

PROF. BERGEY: Probably farther.

A Member: It would be a good thing to do because it would be very cheap and something very practical to do.

PROF. BERGEY: If the pails are placed in such a position and protected against dust, direct sunlight would have a sterilizing effect. We demonstrate that very easily in the laboratory how effectively the sunlight acts. It does not act on the fluid; has no penetrating power below the surface; but you have the bacteria on the surface and that would be efficacious. Of conse, you could not make it come in play all the time because the sun is not shining all the time.

A Member: In case the farmers in many cases have arrangements to make some steam to help out, and they are coming to that rapidly; if on the south side they put a window large enough to accommodate the pails?

PROF. BERGEY: The only protection that I would advise to take is to protect them against dust.

A Member: In the milkhouses with the window in front. It is the custom in many places to hang the pails on the fence. They get dust as well as the ants.

The CHAIRMAN: I still believe that you do not understand the conditions in our community in reference to our milk trade here. The milk will retail anywhere from six cents a quart. There is some milk selling at retail at ten cents a quart. The conditions on the average farm here where they wish to cool their milk their water temperature is generally 50 degrees to 56 degrees in summer, their well or spring water. Now to get a temperature less than that to cool their milk they would have to install some ice. The question is, is the consumer ready to pay the additional cost? That is what we get up against. I know plenty of milk is sold in this town, where they are fairly careful with it, and it sells at wholesale at three cents a quart. You cannot produce it at that.

PROF. BERGEY: The matter of educating the public to that point, of course, that is a very difficult one. If it were possible to take them into the laboratory and demonstrate to them the difference between milk collected properly and cooled and kept cooled and the milk that is not so collected and cooled I think that you would very easily educate them to the point that they would be willing and anxious to pay the greater price for the satisfactory milk. That is just what our milk exhibit in Philadelphia is trying to do to-day.

The CHAIRMAN: Isn't it a very good thing to educate along with the producer the consumer as to how to take care of it after he gets it?

PROF. BERGEY: Yes, of course. If you allow your milk to stand at room temperature in the house it will not keep very long. You simply give an opportunity for the bacteria present to multiply and change, while if the same milk were kept at low temperature it would keep as long as is would be required to keep it.

A Member: Is there such a thing as healthy and unhealty bacteria? What is the source?

PROF. BERGEY: We speak of the lactic acid bacteria as bacteria that are found normally in milk. You find them practically in all milk. I am not quite clear about the inquiry.

A Member: Lactic acid bacteria?

PROF. BERGEY: Unless you mean those we find in human and animal excrement, any number of bacteria, that always ferment the sugar of milk, thus producing lactic acid. They sour milk also but they produce their products which change the character of the milk, make it bitter or change its taste so that it is no longer fit for food; while the ordinary lactic acid bacteria simply change, sour the albuminous substances of the milk with the fats and make them distasteful.

A Member: What do you understand by milk increment?

PROF. BERGEY: I am not familiar with the term.

A Member: When ought it to come down to 50 degrees or 60 degress?

PROF. BERGEY: As soon as possible.

A Member: One hour after drawn from the cow, how often would the bacteria multiply?

PROF. BERGEY: Bacteria under very favorable conditions would multiply in one hour. Under very favorable conditions of temperature they might multiply as much as three times. It should be reduced to 50 degrees within half hour after drawn.

A Member: How soon would you bring the milk from the stable to the cooler?

PROF. BERGEY: As soon as possible the milk ought to be removed from the stable and set to cool. Aeration in itself is not what is needed, simply cooling. The idea that milk has to be aired is rather a faulty one. The odor that we object to in milk is the ordor derived from foreign material, from dirt, and not from anything that is inherent in the milk as such, unless the cow has been fed on something that gives it a particular odor; so that I think of milk simply as being cooled to have the animal temperature removed.

A Member: After taking all these precautions you have mentioned, is it not possible, after we take all that care, after shipping the milk that bacteria can enter the milk that is harmful to health, after it leaves our hands?

PROF. BERGEY: Assuredly.

A Member: In the report of the committe appointed by the Mayor of Philadelphia is was stated that so many people are retailing milk in cities under very unfavorable conditions, some of the places where you cannot sell healthy food let alone milk, and in many cases in houses not fit to live in. How are we going to get away from that? It does not seem to be any use to produce good milk at this end if the care is not taken at the other end? How are we who supply milk cooling stations which has become the only way to ship milk to Philadelphia, how are we to overcome those things? How are we going to get any more for our milk if we do follow all these precautions that you mention? There is only one price there. We meet a certain standard of butter fat and for that we get a certain price, and since we pay for refrigerator cars we are getting a lower price than we have for some years.

PROF. BERGEY: Just how to overcome that I would be unable to say.

A Member: That is what I mean we are up against.

PROF· BERGEY: Not all handlers of milk seem to understand how milk should be treated and handled and all that the farmer may do is defeated in what the handler undoes.

A Member: Professor, is there a law or only a recommendation of the Board of Health, has a law been passed, an act of the Legislature or an ordinance, that makes us send milk under a certain temperature?

PROF. BERGEY: That is a law; I think it is enacted.

DR. CONARD: If the cow's temperature is up to 100 degrees or a little above it, it is not uncommon to find a stable's temperature 90 degrees this kind of weather, and the cows are in there. If the milk is left to stand there at that temperature for an hour, between 90 degrees and 100 degrees, how rapidly will the bacteria multiply? More so than at 70 degrees?

PROF. BERGEY: Very much more so.

DR. CONARD: Do you have an idea how much more so?

PROF. BERGEY: They might multiply two or three times as rapidly at 90 degrees. It depends on the organisms. Some multiply far more rapidly than others. Some would not multiply at that temperature. The temperature would prohibit some from growing.

A Member: Is it not true that multiplying at a low temperature increases the more dangerous form of bacteria that high?

PROF BERGEY: No. The lactic acid bacteria multiply at low temperature while at the high temperature the dangerous form increases.

A Member: Well, then how about the deadly germs that get in ice cream?

PROF. BERGEY: Of course, you get there the form of action which I had not in mind when I answered your question first. You get there the decomposition: it is the decomposed particles, the residues which they have left after they feed upon the ice cream itself.

A Member: Is it true that of all the bacteria in the milk the farmer produces under undesirable conditions, are they the bacteria, 90 per cent. comes from the cows and from the ordor of dung and gets into the pail at this time of year? Is that true that after all, from the dung, from the ceiling and from all these sources, and from the closets while not in condition they should be, isn't it down in the bottom from the cow not being properly cleaned off, does it not take in 90 per cent. of the dirt?

PROF. BERGEY: I should say the percentage is more nearly 98 per cent. or 99 per cent.

A Member: If that one thing was corrected could not farmers produce a good wholesome food.

PROF. BERGEY: That is just what I tried to bring out. It is these extraneous bacteria that have no business in the milk are the ones we can control very largely by these comparatively simple measures.

A Member: What is the best practice, to inspect the herd or the product?

PROF. BERGEY: I think both are useful. I think you cannot discard one in preference to the other.

A Member: In asking this question I do not want to throw any discredit upon anything said in your address because it has been held at some places that it was not only necessary to protect the cow but to produce a sanitary product of the cow as we are trying to do the best we can; but I do believe the public is educated to believe that there is more danger in bovine tuberculosis than really exists, and the question is this: Have you a personal knowledge of an authentic case where human consumption has been obtained from bovine tuberculosis?

PROF. BERGEY: No; I must say I have not because I have never worked on that question personally. All my knowledge is based on the statements of other men whose statements I am willing to accept as authentic. It is a question of immense importance and of great interest to me. I have been interested in bovine tuberculosis for many years, but from my own knowledge I cannot say that I have encountered this organism, but men competent to judge have found them and it is their statements that I am willing to accept.

A Member: They all do know of cases where people obtained consumption from contaminated farms and contaminated people, but we are not sure of this.

PROF. BERGEY: Tuberculosis is more easily communicated from one individual to another than in any other way. It is probably far more rare to find tuberculosis coming from tubercular cows, but we believe it is possible. For that reason we believe we are justified in regarding that milk as dangerous.

The CHAIRMAN: If there are no other questions on this subject, we will now proceed with the regular program. The last topic of the afternoon is, "Essentials of Butter Making," by Mrs. Jean Kane Foulke, of West Chester. I now have the pleasure of introducing to you Mrs. Foulke.

MRS. FOULKE: I don't think I am going to take up your time making an apology for being here. You can look at Mr. Martin and his face will tell you why. He asked me to come here last December or early winter and he is responsible.

But I don't pose at all as an expert. I am not a trained person, except in the school of experience. I have had a little experience and if that experience will teach you anything about home butter making I think I will have also done a good turn.

Mrs. Foulke then delivered her address as follows:

ESSENTIALS OF BUTTER MAKING.

By MRS. JEAN KANE FOULKE, *West Chester, Pa.*

I feel as if I were undertaking a great deal in attempting to tell an audience of farmers how to make butter, because I am not what is termed an "expert" myself; that is to say, I am not a trained butter maker, never having taken a course in butter making in any agricultural school, or indeed in any school save that of experience. However, as you all know, experience is credited with being a good teacher, if a hard one, and it is possible, therefore, that mine may have taught me some lessons that may be of use to some of you.

To make good butter is not such a simple matter as it appears, and it demands a care and attention that is seldom given to it. This fact accounts for the amount of bad butter that you see sold and used, and is one reason why oleomargarine and other patent butter is in such demand· They not only are cheaper or as cheap, but they run more evenly good, keep better and taste better.

The first essential for good butter is to have good rich milk and clean milk, milk that is free from any extraneous flavor such as may be absorbed from the atmosphere, feeds or plain dirt. To get this care must be taken as to the kind of feed used, especially if the milk is for butter. Milk that tastes all right and *is* all right for other purposes, when used for butter will not do at all. One can often distinguish the different tastes of feeds in the butter, and any radical change in the feeding may be at once detected. A little too much silage will spoil butter, and in cases where several cows' milk or the produce of the whole dairy is used, a knowledge of what each cow is getting, the amount, etc., should be carefully watched and known, and the effect upon her milk noted. This should be done in every dairy, as a matter of fact, as it is only thus that the feeding can be profitably done. Many cows do not need, and others do not digest, the kind of food or the amount of it that their fellows in the same stable should have. It is this knowledge of the individual that is a most important feature in any sort of dairying, and it is essential in a butter herd as a cow's milk is affected by her condition and this quickly affects the butter.

Having made sure that there is no taste in the milk from the feed that will show in the butter, the next thing is to be sure that the milk is cleanly drawn—that the milker has clean, dry hands, that the cow's sides and udder have been brushed and freed from manure and dust, loose hairs, etc., and that the milk is taken as soon as possible from the stable to prevent the contamination from the unavoidable odors and dust of a cow barn or milking shed. Care should be taken that the cans and pans are not exposed to road dust and manure and that they are scalded and washed thoroughly clean.

The milk is now ready for the dairy, and it depends very much upon whether it is to be separated or hand-skimmed what is to be immediately done with it; but as I am speaking of profitable butter making I assume that it is to be separated. In my opinion, milk for butter making should never be thoroughly cold. It should be *cool,* but never thoroughly chilled. In the dairy of which I have charge the milk is separated at a temperature of about 75 to 80 degrees. It is necessary to hold it over night, as we separate but once a day, so that the evening's milk is set in coolers or cans in the spring. These coolers hold about 12 quarts, a convenient size to lift.

Our spring water keeps about 56 degrees. I have a coal stove in the spring or dairy proper and keep a low fire all winter, keeping the temperature about 60 degrees and we try not to have it vary more than a degree or two one way or the other, and are very careful about ventilation and to prevent coal gas, dust, etc. Men are not allowed to enter the dairy in their working shoes nor is smoking allowed there. Care must also be taken after white washing. This dairy is an old fashioned spring house and has been made over somewhat to suit modern methods and increased trade. Of course it would be better if it could be heated by pipes and thus do away with the stove, which in this case necessitates covering the cream each time it is raked and the ashes removed, and great care in seeing that there is no coal gas which would affect the cream at once.

The cream should be stirred down every day and thoroughly mixed. To do this I have a round disk of tin, with a row of inch holes, fastened on a steel rod about two and a half feet long, about like a poker. This disk or tin plate is just large enough to fit inside the coolers and be moved up and down, allowing the cream to come through the holes and thus becoming thoroughly mixed. Cream should not be allowed to fall far from the separator to the can, as the air in the froth on it seems to make it rancid very soon and stirring down into the can ruins the whole can of cream.

Ripe cream is *sweet* cream *soured.* Soured cream has a pleasant smell and is not rancid or strong. It tastes good and is pleasant to eat. I know of no better dessert than a saucer of soured cream and a slice of soft ginger bread, and can think of nothing worse than to have to eat a saucer of *sour* cream even if accompanied by "angels' food."

Sour cream is cream that is spoiling and on the way to putrefaction, but soured cream or what is called ripe cream is luscious and sweet. It has reached a point of fermentation where it is still fresh and unspoiled, and has not yet begun to decay. To bring cream to this state at the time desired is a delicate matter. In my own case I have the coolers lifted out of the spring and stood on the cement floor, and into each one I put a little more than one-half pint of souring from twenty-four to thirty-six hours before churning. This in an atmosphere with a temperature of 60 degrees will ripen the cream sufficiently for butter making, although if the dairy temperature is lower it may take longer.

The souring is made fresh each butter day—we churn twice a week, each Monday and Thursday—by taking six quarts of separator skim milk and adding two quarts of fresh butter milk, which is well mixed and kept stirring each day, the top being taken off before being used for souring.

The public demands butter of a good rich color, but except in Summer, and not always then, do even Jerseys given cream that will make yellow butter· Therefore the butter maker must resort to some of the many kinds of butter coloring that are on the market and are sold under the pure food laws. I have used "anato," which is a South American gum or root which comes in a powder very finely ground, a purely vegetable compound and entirely harmless. I know of but one place where it may be had and that is at Hansell's, No. 8 S. 18th Street, Philadelphia. I used to buy it by the pound but now it must be bought in five pound packages. It should be kept in a dry place. Preserve jars make good tight receptacles for it, and by opening one jar at a time the balance may be kept safely. I use at this season of the year and through the Winter one tablespoonful to seven coolers of cream, mixing it first in about 1 quart of luke-warm water, and then stir it in the cream with the mixer described before.

The cream is now ready for the churn and to get the churn ready for the cream is the next step. I want to say here that scalding water, and plenty of it is a necessity to successful dairy work, and if one can have steam also it facilitates the work of cleaning and sweetening the dairy utensil's, churn, separator, etc., enormously. The churn should be thoroughly scalded and rinsed, then chilled with plenty of fresh, cold water, after which it is ready for the cream, and we may begin churning. In this cleaning work use no soda and no soap except possibly to wash the rubber rings of the separator.

It should require about half an hour for the butter to come and as soon as you have butter the size of shad roe or very small marbles it is time to stop churning. After that to continue churning merely injures the texture of the butter. You get no more out of the cream but merely gather it into large greasy lumps.

Draw off the butter milk through a wire sieve to catch the butter that will flow out with it. Then rinse the butter with cool, not cold, water and take it from the churn.

While the churning is being done, one should have scalded all the paddles, prints, etc., to be used, also the butter worker, and should have chilled them afterward and left them in cold water· We set ours in the spring to await our needs.

The butter is put on the worker and the salt is spread over it. We allow half an ounce to the pound, and it should be weighed, not guessed at, unless you have buckets to hold the butter and measures for the salt that have been tested, so that you know what you are doing.

A sponge with a bit of cheese cloth about it makes a very useful thing in working butter. One should stand sideways to the worker, with a sponge in one hand the paddle in the other, and keep turning the butter up and over to the worker, and keep constantly patting it with the sponge, thus absorbing the water more quickly and lessening the danger of destroying the grain by over-working to get dry. The water and the salt should, however, be well worked out, not only the experience can tell one when this is sufficiently done; but there is a look that means a little to the experienced butter maker that the butter is worked.

In butter, as in everything else that we want to sell, appearance counts for much and care should be taken to have the prints sharp and well cut, so that the butter may take the impression clearly, after which it should be neatly wrapped in butter paper and set in pans to harden. In Summer the butter is often too soft, when first printed, to wrap and should be laid on open papers in the pans and wrapped later. The triangular point of paper at each end of the package should be turned under, rather than/ upwards, in wrapping as it makes a neater package. Some persons have naturally cool hands and these are fortunate if they must handle and wrap butter. For myself, I have a warm hand and so must be continually dipping my hands and arms to the elbow in cold water to keep my fingers cool and dexterous.

Too much care cannot be given to the cleaning up after butter making, for much of the success of the next butter depends upon the sweetness of the utensils used; and especially when they are wood is it necessary to scald and scrub and steam them, clean, chemically clean, so that no animal fat may enter the grain to decay and thus destroy the possibility of making good butter or keeping the dairy tools sweet. It is impossible to get them thoroughly clean if once the grain gets full of rancid fat and grease.

A dairy should be light and cool and well ventilated; not a dark, damp little cave as many of them are. It is impossible to make good butter without clean, sweet milk and cream, and clean, sweet surroundings; and it is this cleanliness and sweetness that makes the charm of the churn and that are the essentials of butter making.

The CHAIRMAN: The paper is open for discussion if any person wishes to ask questions.

DR. CONARD: About what percentage fat is that cream, heavy or light?

MRS. FOULKE: Very heavy.

DR. CONARD: I suppose 40 or 50?

MRS. FOULKE: Yes, sir. I made a few notes here that I thought would be interesting. I kept very careful account in connection with the dairy and I though possibly they might interest some of you gentlemen as well as the ladies. In the dairy that I run we have milked 28 cows. They are grade Jerseys, most of them. We have a 13-horsepower boiler and 5 horse-power engine. That engine runs the separator and churn and butter worker and the pump that pumps the water to the mansion house. We have a 60 lb. Embree butter worker, cylindrical churn with perforated paddles.

Now I have been feeding to 28 head 35 lbs. of ensilage, 1 lb. cotton seed meal and 10 lbs. of grain, 5 lbs. of Sugarine Dairy Feed and Holstein Grains; then about 8 lbs. of hay in the middle of the day. In January, 1911, we produced 711½ lbs. butter; in February 621½ lbs.; March, 862 lbs.; April. 895 lbs. Of course, that was taking the dairy, some dry some fresh and some just milking along. I struck an average for the year, from April 1st, 1910 to April 1st, 1911. I could not give the amount exactly of hay or straw used, neither could I give the account exactly of the cost of raising the corn for ensilage, but I did count the time taken to cut the corn and filling the silo and I took the wages of the two highest priced men on the place who have to do with the dairy and all the cost of bought feeds; also I counted the by-products of the place which I regard as very valuable in connection with the dairy. I bought some and sold some; and added on that, and I find that in the year from April 1st to April 1st we had made a net profit with those things taken out of $2,115·13.

A Member: When do you feed?

MRS. FOULKE: I have had the feed put in when the cows are put in.

A Member: Before milking?

MRS. FOULKE: The feed was put out for the cows ,of course in the winter when the cows are in the dairy. Now they are turned out and the feed is put in the trough for them and they come in at supper. They get the ensilage after they are milked, just afterwards. I put the grains in and they get the ensilage just afterwards.

A Member: How long do you leave the butter stand after you have it all printed?

MRS. FOULKE: I put it right away as soon as I can do it. Yesterday we made enough butter to have to work three different workings and went right to work as soon as we could. I have pieces of muslin cloth and we keep the butter in that after it comes off the worker and then we work it just as fast as we can.

A Member: Have you had any experience in working the butter in the churn?

MRS. FOULKE: No, we do not do that.

A Member: I understand your barrel churns roll?

MRS. FOULKE: Yes, roll around.

A Member: This is round?

MRS. FOULKE: Yes.

MR. BARNES: Did I understand you to say that you held the milk over from evening to morning?

MRS. FOULKE: Yes, we hold the milk over from evening to morning.

MR. BARNES: Do you find that more profitable than while the animal heat is in the whole of it?

MRS. FOULKE: I have been doing it because if you want to start up the machines, if you have a boiler it takes considerable fire.

MR. BARNES: In our case we use a gasoline engine?

MRS. FOULKE: I don't know whether you are lucky or not.

MR. BARNES: We separate twice a day.

MR. RODGERS: At what temperature do you separate the milk?

MRS. FOULKE: 75 degrees.

MR. KERRICK: How about your ensilage material?

MRS. FOULKE: I leave it go until the leaves begin to turn and it is about time to mature and then it comes in with the rest of the farm work. That is, I think the more corn it has in it the better it is. The best ensilage I had I had made from millet. I had a little millet. We thought we would be short of hay and we planted millet; then the hay came on; and I cut it just as the seed was becoming round. We cut it the way you cut oats and we put it in the silo and we didn't empty the silo for three years and it was as good at the end of three years as when it went in.

A Member: Would your butter stand up better than creamery butter?

MRS. FOULKE: Better. I sell it in West Chester to a very careful community. They are most of them Friends and they know when they spend money, and several people have said to me that one pound of my butter would go as far as one and one-quarter pounds of creamery butter or other butter.

A Member: What price do you get?

MRS. FOULKE: I would not take less than fifty cents just at West Chester, and for some butter I get seventy-five cents.

MR. CLARK: There is an agitation all over the country—there is a law—I do not know whether it will pass this week—that you have got to sell full weight now.

MRS. FOULKE: I do that.

MR. CLARK: Suppose you put up a pound trade print, how long will it remain a pound brick?

MRS. FOULKE: My butter is so good that people eat it before it has time to shrink.

MR. CLARK: The Elgin people supply nearly all of the butter in the western end of the State and when it goes into the market to the consumer it weighs but a fraction over fourteen ounces, never very much more than a fraction over fourteen ounces. What is that fellow going to do?

MRS. FOULKE: I would try not to buy that butter.

MR. CLARK: They say they put up pounds. What is the reason for the loss?

MRS. FOULKE: I think they put it up all right but they put a lot of water up with it and water will evaporate· Butter well worked will stand up.

MR. CLARK: It will not lose that much?

MRS. FOULKE: It will not lose at all.

MR. CLARK: These fellows are in Harrisburg lobbying now?

MRS. FOULKE: Oh, well, I can't vote.

A Member: What percentage of moisture is there in butter after it is worked?

MRS. FOULKE: Not any at all. I work mine as dry as I can get it.

A Member: What is the average income on each cow? You say you had 28 cows?

MRS. FOULKE: I do not think I could tell you that. If I knew that you were going to ask me that question I could have answered.

A Member: How many acres of land do you have?

MRS. FOULKE: The two farms that I have charge of make about 150 acres; and I also rent a great deal of extra land from neighbors or else buy the crop. Last year I had between thirty and forty extra acres costing about $76.00.

A Member: Do you pasture your cattle?

MRS. FOULKE: Last year I did.

A Member: Did you ever run over a year that you did not pasture?

MRS. FOULKE: No I never tried that·

MR. DEWITT: I wish to make a little statement. We have up in our country a condenser near Mansfield, Tioga county. A man coming from the vicinity of the condenser has ten cows; just cows not only fancy breed but good looking cows. I saw the cows. He patronizes that condenser. His cows brought him in $96 a year without any of this extra trouble, apiece.

MRS. FOULKE: $76.00 a year over and above the cost of food and labor would be the average for each of my cows.

A Member: You did not figure out all the feed.

MRS. FOULKE: Total profit of $2,115 on 28 cows would be just about $76.00 apiece profit after the labor and feed were paid for. The only thing I did not account for was the hay and the corn in the ensilage; but against that I left the heifers, I left the 15 heifers; and the manure certainly ought to cover the hay.

Deputy Secretary Martin then announced the program for the evening and granted five minutes to Mr. Charles W. Evans, representing John R. Livezey, 1933 Market Street, Philadelphia, Pa., dealer in cork brick floors, to explain the merits of his wares.

Mr. Evans addressed the Institute as follows:

MR. EVANS: I thank you and I thank the gentlemen who are here and have kindly extended me through you this courtesy.

I am here, ladies and gentlemen and Mr. Chairman, with an axe to grind as I have been at a few of the Farmers' Institutes held this Spring more closely to Philadelphia. That is to say, I attended nearly all of the Farmers' Institutes held within a radius of 50 to 80 miles of Philadelphia. I am advertising cork brick which is a comparatively new substance and has been successfully used in paving cow stables, pig styes and for horse stables also. This material was first made upwards of two and a half years ago in a little different form from what it is now, or in other words, somewhat softer than now. We have a material here which according to my argument is the only practical pavement for a dairy barn in that it possesses qualities which no other material possesses. If we have a concrete floor we have a degree of sanitation, but we have a hard and cold floor and we also have a floor which is slippery after it has been worn sometime or if it is put down and roughened upon the surface in order to prevent it becoming slippery, then we lose the sanitation, because we have the lodgement there of the manures of the stables. In cork brick we have a material also which absorbs less moisture than any other known practical paving material. It absorbs only one-half per cent. moisture. Concrete absorbs a large quantity; I do not know what proportion but I do not think I am wrong when I say it would absorb anywhere from twelve and one-half to fifteen per cent. moisture. That, of course, is the pavement used at the present time more extensively than any other in our improved dairy barns. There is but one drawback to the use of cork brick and that is its cost. It cost anywhere from three to four and one-half dollars a square yard to lay it, according to conditions and according to whether or not it is desired to put down the concrete foundation upon which it should be laid. Now I am laying these facts before you in order that you may think them over, that you may be in possession of facts which undoubtedly should be of interest to dairymen and to stockmen. I know that this pavement is a successful one. I also know that it is costly. We cannot get away from that fact. It is so good that my argument is that it pays to pay out this extra money for it, particularly where we have a registered herd as on a dairy floor and in the stock business. I attended a sale not long ago where there were three head bought by one man for $3,600. Of course, other cattle are sold higher than that. But what will be the result if a bull worth $3,000 should fall down and break his leg. I know that is somewhat remote, but sometimes that will be brought home. We have here a pavement that is sanitary; that is never slippery, wet or dry; that is resilient; never becomes cold like tile or concrete. We are told by veterinarians that cold pavements may start up bad diseases and where already contracted they may make them worse.

I have brought with me, contained in these packages that I have here some full sized samples of these cork brick which I am very desirous should be carried away by you gentlemen if you are at all interested in this subject. They are gratis. I also have reading material. I also, in addition to that, have some small samples which are at your service.

The CHAIRMAN: Is there any other business before the meeting? If not, the meeting now stands adjourned until 7.30 o'clock this evening.

Tuesday Evening, May 23, 1911, 7.30 o'clock.

Dr. M. E. Conard in the Chair:

The CHAIRMAN: The meeting will please come to order. The first subject on the program this evening is, "What is the Matter with Pennsylvania Farmers." That is what we all want to know and Mr. T. D. Harmon, of the National Stockman and Farmer, will tell us about it. I take pleasure in introducing Mr. Harmon to you.

MR. HARMON: Mr. Chairman, Ladies and Gentlemen: I wish I could tell you all "what is the matter with the Pennsylvania Farmers." I am going to read just what I have to say. I have written this out carefully. My stenographer wrote it for me and I think she said some things which may interest you. If it don't, tell me to stop and I will do it at any time. From what I learned since I came here, there is certainly something the matter with the Pennsylvania farmers. Mr. Martin asked me this Spring if I would not go on the program. He is a great joker and probably wanted to spring a joke on you. He told me I could select my own topic and I selected this and he acquiesced. I think it would take several volumes to tell "what is the matter with the Pennsylvania farmers" before I got through; not in the way of criticism, but I really found lots to think about and I wish I could convey to you all the thoughts that have gone through my head in the last three or four weeks on this topic. I believe you will all admit there is something the matter with the Pennsylvania farmer as well as the farmers of other states. I will simply stick to my manuscript. They asked if this screen and picture machine belonged to me and I said yes. Somebody said I had the pictures of every institute worker in Pennsylvania, and I also had the pictures of their farms and was going to show the people just what they looked like. I am sorry I have not got them as I believe it would be interesting to everybody here.

Mr. Harmon then presented his paper as follows:

WHAT'S THE MATTER WITH THE PENNSYLVANIA FARMER.

By T. D. HARMON, *National Stockman and Farmer, Pittsburg, Pa.*

It is an old and true saying that "Our friends tell us our faults; our enemies encourage them." It is upon this theory that a few thoughts along this line might not be amiss on this occasion. Without the remotest idea of fault-finding or criticising any one or any condition, "with malice toward none and charity toward all," it shall be the aim of the speaker to point out *some* of the shortcomings of *some* of the farmers of our grand old Commonwealth, and if possible offer some suggestions for overcoming the same.

No man is perfect. The trained mechanic, the learned professor, the teacher, the doctor, the business man—each make mistakes. Then why should we not expect to find errors in judgment among those who till the soil or tend the herds, and while looking for those things which might be made better among the farmers of Pennsylvania, it is only justice to say that in other states worse conditions prevail and criticisms could be applied more fittingly than in our own.

I honestly believe that the first and greatest fault to be found with the farmers of this or any other state could be placed under the head of *Laziness.* I anticipate a storm of protests from those who hear this, from those who have been putting in from fifteen to eighteen hours out of each twenty-four hours of the day during this busy season we are just now passing through, but I stick to the original proposition. It is said that God, as a climax to His creative genius, made Man; that he made him a little lower than the Angels; that He gave him reason and the power to think; that He then placed him in the Garden of Eden and gave him power and dominion over every other living creature. Later on in the Good Book we are told that He classified the peoples of the earth, making some of them kings and princes, overseers, hewers of wood and bearers of burdens. There is a significance in all this. If the allwise Creator has done all this—has recorded in His Divine Word an outline of His idea as to what man should do and man should be, then it is our duty to study His designs and purposes and follow them out as nearly as possible. If God gave you more brains and less muscle than the ox, then He intends that you should use your brains more than the ox and your muscle less than the ox. Herein is where the word "lazy" applies to too many men—whether they are farmers or follow other vocations. I believe, however, that it will apply more often and more directly to those who till the soil than to any other class of people.

In making this broad assertion, the term lazy is to be applied to mental and not physical labor. In other words, to the use of the brain instead of the muscle. How many men do you know, and you can possibly include yourself in this, who would not cheerfully go out and plow all day or chop wood or do any other hard manual labor rather than sit down and study out some difficult problem in farm management; or on the needs of his soil, or his livestock, or even write a nice long love letter to his wife if she is away from home, or an urgent letter to his wife's mother, urging her to come and spend the winter with him.

It is mental laziness that is referred to not physical, and is as common among farmers as good healthy thirsts are in dry territory. It is great thoughts that make great men. Clear thinking puts in motion actions that bring big results. We take our hats off to the great thinkers of this country. Did you ever stop to consider that one man was just as much of a thinker as another? He can't help but be. God put brains into his head, wound them up and started them off—just like the watch-maker puts wheels and springs into the watch and starts it. He can't help but think. He'd die mentally if he didn't. The only surcease is when he is asleep—and even then some men dream things that are more rational than their thoughts when awake. The neglect, or delay, or abhorrence of getting right down to work on lines of thought that stand for something and mean something for mankind in general, and the thinker in particular, constitute a laziness that has meant failure in more cases than has ever been recorded against the sluggard or the tramp.

David was a shepherd boy. That would mean to-day that he was a farmer boy. He tended the flock and possibly did the chores and churned the butter and answered the telephone and cranked the automobile and oiled up the flying machine for Jesse, his father. Possibly he pumped the pianola and run the phonograph for his mother. These are some of the things that he would have to do to-day if he acted in the capacity of a farmer's boy. But David did one thing more. He kept his thinker going in the right direction and acted upon his thoughts. He heard the sweet songs of the birds while in the groves. It put an idea into his head and he worked it out. His mind ran something like this: If the birds are capable of making such sweet music, why can't I? The same hand that gave the birds their songs gave me brains, more brains than all the birds in the mountains round about. I am superior to all other living things because God made me so. It is a great responsibility but I accept it and will use my talents. David did some good, clear thinking. Result: the mastery of the harp—music that inspired the highest thoughts of those who heard it and enabled the player to write songs in later life that for beauty and grandeur of thought have never and never will be equaled.

But David did another thing that brought him into the limelight probably more than his playing the harp. He learned to throw straight to hit the mark. He may have learned this while chasing the woodpeckers out of the cherry tree or pelting the cats in the backyard, but he learned the art and he did it well. A big lesson lies right here. It is the easiest thing in the world to throw a stone and the hardest thing in the world to throw it absolutely straight. Goliath used his muscle to carry his armor and sword, which would have crushed the stripling, but David used his brains not only to select his sling and his pebble, but to find the soft spot in the enemy's anatomy. If Goliath had been hit on his muscles the stone probably would have deflected like a projectile hitting the armor plate on one of our modern battle ships for he had exercised his muscles only and they were like steel. His soft spot was his head. He had neglected to exercise it and it could not withstand the attack of even a smooth pebble into hands of a mere youth. There are too many men in all vocations that are just like this big ugly giant, they go about boasting of the mighty things they can perform, the amount of work they can do in one day, the men they can whip, the tricks they can play on their neighbors in a horse trade, or their ability to get the other fellow to carry the heavy end of the log, while their brain, their intellect, their ability to think better thoughts and do better things has been dwarfed for lack of use because they have been too lazy mentally and morally to develop into that broad manhood, those higher ideals that the allwise Creator made possible for them to enjoy and which will be the answer to the prayer which we have all been taught at our mother's knee, "Thy Kingdom Come."

Pennsylvania was the pioneer agricultural district of the American Continent. Her soil, her climate, her industries, thrifty citizens and her geographical position made her the leader, giving to the new world and the new nation the best that the land would produce in grains, fruits and livestock. This preeminence was maintained without question until the sturdy sons and daughters of her prosperous people were allured toward the land of the setting sun, where homes could be secured for less money and prospects for prosperity seemed greater. This exodus of the children of Pennsylvania certainly did not rob her of her brains and honesty and integrity, but it must be admitted that with it went a liberal percentage of her enterprising and enthusiastic citizenship. The motive which lead men to venture into new territory imbued them with the idea of other new ventures and as a result we find the livestock interests of the Western states are far in advance of those in our own state, and I confidently believe that one of the greatest things that "is the matter with the Pennsyvania farmer" to-day is his neglect, rather his lack of interest in keeping up his herds and flocks. It is said that livestock and agriculture go hand in hand in making a country prosperous. In some sections of this State but little livestock is found that was reared on the local farm, hogs, sheep and poultry excepted. This is wrong. It is expensive. It is a bad system and should be corrected. Not long since I saw upon the farm of one man in a central county of this State as fine a farm team as could be found any where on earth. Upon inquiry I learned that the team had been purchased from a western shipper, who had distributed hundreds of good horses through that section. The team referred to, I learned cost the owner a sum of money that would require a thousand bushels of wheat or nearly two thousand bushels of corn to equal. This was robbing

Peter to pay Paul. The cost of that team represented the crops for two years of the farm on which it was working. This farm was saving at the spigot and wasting at the bunghole. Besides all this he was hauling away the fertility of his soil which could and would have been maintained by raising these horses instead of buying them. Livestock is the crying need of the greater part of our State and the full and lasting prosperity of our farmers will never be attained until the fact is realized that the fertility of our soil is the salvation of our country, and that fertility can be produced and kept up better and cheaper by marketing our grain crops on the hoof than in any other way. A prevalent fault or misfortune of most farmers is their inability to see the advantages of first class blood in all kinds of livestock and their unwillingness to pay a fair price for the kind of animals that will produce the kind that brings the best prices in the market. With a general awakening along these lines, Pennsylvania could step at once to the front as a livestock state, for she has the soil, the climate and the proximity to the best markets of the world. There is no question but what the valuation of the farms and farm products of the State be enhanced possibly many fold if the lowing of the kine, the bleating of the lambs, the contented grunt of the hog and the neighing of the young colts was heard on every homestead of our great commonwealth.

Lack of knowlege as to how to co-operate is one great misfortune of our farmers. Individually by inheritance, by training and by practice, they are slow to understand the benefits of concerted thought and action. Community interests bring to our people some of the very best things in modern life. Citizens of villages, towns and cities have learned that the welfare of their many interests are better conserved by planning and working together. Business men find that by mutual understandings and combinations of efforts many things can be brought about that would be impossible in any other way. The independent thinking of farmers and the pride in their personal opinion makes it a hard matter for them to get together and work together for their mutual benefit. The commercial interests of agriculture has suffered more than this lack of co-operation, possibly, than from any other cause. A close study of the markets, conditions of prospective crops, supply and demand and many other features of the commercial side of farming, farm topics that can be discussed to advantage and ideas formulated after considering the views of the many instead of the individual, and they are always more nearly correct than those based upon the opinions of the individual. Co-operation in every phase of country life and country conditions will be highly profitable from a social and commercial standpoint.

Conservatism is the stumbling block of more farmers to-day than possibly anything else. Slow to believe, slow to take hold and slow to take advantage of things that are to their interest they let slip by opportunities that would benefit for all time to come. Within the past ten or fifteen years science has done more for the farmer in a practical way than had been done in centuries before. Scientists learned that if their work was to be appreciated it had to be practical. Commercialism had set a price on things that were useful. Everything else went into the discard. Scientists caught on. They always do when their bread and butter is at stake. They began to develop things that men who did not have such useless appendages as A. B., D. D., L. L. D., and D. M. P. H. L. after their names could understand and put into practice. It began to work. It was what the common herd wanted. It helped the farmer get hold of more dollars. In turn the "learned men" got more dollars and they worked on and harder and made their work more and more practical. To-day scientists are leading the farmers out of the wilderness by a shorter route than Moses lead the children of Israel. But Moses had his doubters. Many of those old Jews were "from Missouri". No doubt they told him so. It is so today. Human nature has changed but little since Eve ate the apple. "Show me" is the slogan that too many have adopted. "I'll try," should be substituted, and if one thing stands in the way of progress in agriculture more than in another it is the habit of doubting the progress that science is making along the lines of better farming. The only difference between a rut and a grave is its length. You might as well be in one as the other. I do not say that all this applies to all farmers, but it unquestionably does apply to too many, and it is undoubtedly the duty of those who have safely landed on the banks of the ruts to help their unfortunate brothers out.

Too much pride in the ownership of land is another common fault. Large landed estates is the bane of any community. It seldom adds to the happiness or wealth of the owner. Take a concrete example. Suppose that a man owns 100 acres of land. He has accumulated in cash $10,000. Another 100 acre farm adjoining can be bought for $100 per acre. Would it not be much better for him to use his surplus cash in improving his own farm rather than spending it to doubling his acreage. Think what $100 per acre would do if used under scientific methods in the improvement of the soil. Think what $10,000 would do in the way of stocking a farm with all kinds of pure bred livestock; what profits would accrue from the increase of the flocks and herds and how a man would be improved himself morally, mentally and every other way by associating with the higher types of animal nature. It is, indeed, more elevating often to be associated with a high grade hog than a low grade man. Think what $10,000 would do in the way of installing conveniences on a farm. No dwellers in cities could boast of such healthful surroundings. The drudgery of farm life could be eradicated. Health and happiness could be enhanced and life prolonged. The proud possessor of 100 acres of land under these conditions could add to his own happiness, to the happiness of his family and be a blessing to the community in which he lived. It is things like this rather than acreage that measure success and places the man in the front rank among his fellow men.

Another weak spot among farmers is their lack of appreciation of leadership. Our armies have their generals, our navies their admirals our governments their rulers and our political parties their "bosses." Much as it is to be regretted that that word "boss" has to be applied so often, it is nevertheless that no organization or party could be maintained long without some one to control it and direct its policies. There is a difference between a boss and a leader and there is but little danger of the former lasting long at the head of any organization or forward movement among the agricultural classes. Some men are endowed by nature to be leaders. Others fit better in the ranks. When thrown together for the betterment of a common cause they find their respective places as naturally as water finds its level. Petty jealousies, misunderstandings, etc., are the sins of some communities. They retard progress and prevent the accomplishment of much general good. Farmers should rally their most capable leaders in every community and support them in his every effort to bring about better conditions, more prosperity, less friction and a square deal for the producer.

Modesty, or rather, false modesty might come in for just criticism among the farmers of Pennsylvania. There are men in this State doing things so much out of the ordinary that if the things were done in some of our Western states the public press would be crowded exploiting their great deeds. Boasting is abominable, but we are commanded in the Good Book not to hide our light under a bushel.

Many and various other weak spots might be dwelt upon under the title of this talk. It is not with a view to holding up to ridicule the weakness of our fellowman that reference is made to any of them. We are all mortal. It is said, "A wise man will change his mind; a fool never does." Upon this theory it is our duty to find out our faults and correct them. The world depends upon the farmer to be fed. Financiers look forward to your bounteous harvests to know how to figure on all their large financial transactions. Our nation is depending upon you farmers to furnish it with its presidents, its statesmen and its leaders. The most of our rugged, honest, fearless men in all the higher callings of life came from the farm. As the states make the nation so do farmers make the state. It is not our cities that furnish the brains to plan and the bone to build. It is the farmer's son who steers his course whether in commerce, statemanship or the pulpit—straight as his father guided the plow. The simple, fearless faith of our forefathers is waning. The rush of business, the strain of commerce, the love for notoriety in statemanship do not encourage it. If perpetuated at all it must be perpetuated on the farms of this country. You, as farmers, are entitled to all the honor that such a condition imposes. But with it rests a responsibility. Meet it like men and if then there is anything the matter with the Pennsylvania farmer that is not in accord with the most critical mind it will all be forgiven.

The CHAIRMAN: The next subject is "The Country Life Situation," by Dr. L. H. Bailey, Director of the Experiment Station of Cornell University, Ithaca, N. Y. It gives me pleasure to introduce Dr. Bailey to you.

Dr. Bailey then addressed the Institute as follows:

"THE COUNTRY LIFE SITUATION." (Abstract).

By L. H. BAILEY, *Cornell University, Ithaca, N. Y.*

Mr. Chairman, Ladies and Gentlemen, I come to Pennsylvania at this time with a great deal of satisfaction. For the past two or three years I have had a grudge against the State, because you took Dr. Hunt from us. I am coming to you to-night to speak and to get even with you.

I shall speak a few words about the "country life situation," as I see it. Two movements are now much in evidence touching country life. One is the "country life movement" itself, and the other is the "back to the land" agitation. These two movements are not at all synonymous; in fact, to a large extent they are antagonistic the one to the other. The country life movement is the effort to effectualize country life for those who are a part of it, to better the agriculture, to improve the schools, churches, roads and whole economical situation and the social condition. And as the effort to improve any society is fundamentally sound, so the effort to make country life more effective is socially and economically a sound movement. It is not necessary for us to assume that country life of itself is less developed or more developed than city life, but only to bear in mind that country life is not as effective as it is capable of being.

The "back to the land" movement is very largely a city impulse; in part a desire of cities to relieve themselves from congestion; in part a desire or effort to find work for the unemployed or to find possibilities for the "ne'er-do-wells;" and to a considerable extent the effort of real estate dealers to sell land.

Of course, we need good farmers and it does not matter whether these men are country-bred or city-bred if only they are qualified by experience, by type of mind and by other qualifications, to be farmers. But a large part of the city-to-the-country movement is socially and economically unsound as a solution of rural ills. A great many persons, undoubtedly, who are now going from cities to country will be very much disappointed. This will not be because farming is a poor business, but merely because many of those persons who go, will not be qualified to be farmers. Ordinarily it is unsafe for any man to change greatly the character of his life or activity after he is thirty-five or forty years of age. There are some inexperienced city persons who go to the country past that age who makes a success; but I am convinced, as compared with the whole number, that they are few. I am interested not in the "city to country" movement, because I am not a student of city affairs. I feel that other means must be invoked to solve the city matters than merely to send the surplus to the country districts. I am interested primarily in the re-direction of country life.

The theme that I wish to develop in your mind to-night is this: it is very necessary that at least a part of our civilization have contact with real experiences, real situations, with elementary conditions. The tendency of the time is the splitting and the complexing of our civilization and the developing along partial lines. There is a lack of wholeness in our lives. This is illustrated in our common manufacturing. For example, we no longer use the whole wheat for bread. We refine it out, first taking one thing and another out of it with the idea that apparently the value of bread lies in its whiteness and not in its completeness. It lies largely in its looks and baking quality. It is very necessary that a good part of our civilization have direct contact with Mother Earth and with types of experiences that bring many native qualities into play.

The farmer's business has relations with a large line of effort, which altogether makes up his type of life and his philosophy; whereas a man working in a shop does largely the same thing day after day and his philosophy of life may not be connected intimately with the character of the work that he follows for a livelihood. In the farmer's business, the philosophy of life grows out of the situation in which he naturally finds himself. The farmer is a real part of his background. He is as much a part of his farm as the trees, or the livestock or anything else on his place. It has often been said that farmers ought to live in towns, as the European farmer does. My conception is quite the reverse. There is the greatest necessity that a good man live actually on the farm. You cannot look after a farm when staying in the town; and the better the man the better also ought to be the farming. The greater complexity of the farming business, the greater is the necessity, of a good man being constantly with the business. The farmer has a different relation to his business from that of any other man. The merchant or manufacturer may plan his business from a distance and may not live in his store or his shop. The farmer is in his business day and night and is a part of the weather, and the crops and the soil.

I sometimes wonder what the farmer is going to do with all the advice he is now receiving. I wonder if he is going to be confused with the multiplicity of leaders, whether he is going to assimilate all the new work and make use of it. But with all the advice and talk and exhortation, the farmers have never yet been in a stampede or riot. That is not so true of city conditions. It is because they themselves are so closely in touch with the fundamental situation that they do not lose their heads. The new ideas are to be worked out, if at all, by persons who are a part of the situation. I would not capture a man and put him into a community for the purpose of working out any idea I may have. I would prefer to drop the ideas into the midst of the farming people and let them discuss them, and work them out in detail and slowly and fundamentally. There will be the teacher and preacher, the good farmer and forward man and woman here and there who will take up the work and try to work it out. If the new notions are allowed to be freely discussed by the farmers themselves, all those which are impracticable and chimerical will not persist, and those that are useful will in time bear fruit. We may count on the wild notions to fall on stony ground.

Again, in regards to fairs. I do not know how it is in Pennsylvania, but I am convinced that in general no money is given for agricultural purposes which produces such small results as that given to the fairs. Now, the difficulty with fairs is that they have grown away from their natural purposes and reasons. They are gaudy with gimcracks and geegaws and all kinds of extraneous and meaningless things. I know many fairs that are serving their communities admirably, but, I am speaking in the large. I would not eliminate the county or local fair, not by any means. A man came into my office last winter and said, "our town fair is dead;" I said, "good." But he also said "we want to reorganize our town fair;" and I said "good" again. I suggested that he ask twenty of the best farmers whether they would come together for a plowing match with their best turnouts, their best men, harness and plows, and exhibit the most skillful practice in plowing. Why not make this the centre of a town fair rather than horse jockeying, and gather the other things around it, with good entertainments and good games, and bring into it all the good speaking you can about the good art of plowing; and around this centre build up exhibitions and exhibits of real value to the small locality. I think a local fair should exist only for educational purposes. I use "education" in the broadest sense. Of course, I would have recreation. I would have games and good entertainment, but I should try to have the enterprises develop out of the real affairs of that community as rapidly and as fast as possible. Too many of our fairs are colored by the events and the men who go from one fair to another, and which have no particular relation or connection with the development of the community that the particular fair represents. I am not opposed to horse-trotting as such, but if I had it I should want it to have some relation to the development of the horse types and welfare of the community or the State.

Now about the schools. It is most interesting that the schools do not represent the localities in which they exist. Our schools are yet male. The schools are attended by girls, but the studies are the old boys' studies. The centre of our civilization is the home, and no school in any community can rise to its possibilities until the home and family are the centre of its effort. The object of education is to teach persons how to live, if that is the proper definition, then the schools of the community must have direct relation to the welfare of the community. It must have relation to good cooking, to good housekeeping of all kinds, to sanitation, as well as to farms and business. A person said to me a few days ago: "Do you think a person can be an educated man or woman unless he has had Latin?" The person first took the precaution to ask whether I had Latin, and I had confessed I had. I wished then I had not had it, to have seen what the line of argument would have been. If the definition of an educated man is one who has had Latin, then it is easy enough to determine whether a man is educated,—we may ask him. I would not eliminate Latin or Greek. I would have a great deal more of it. My point is that no one subject is the exclusive means of education. Persons may be taught to think just effectively by study of farm-management as by the study of mathematics or Latin, if it is equally well taught. It has not been so well taught in the past, we must admit. The older subjects are better organized and solidified; but I contend that in themselves they have no greater or unique educational power. I had in my office for a long time a placard on which was a remark dropped by Dean Hunt: "Teaching, not telling." This is the core of education. It is not merely filling up on facts. I would not have our common schools merely inform the children about farming. That would not be education. But I would develop a system whereby the schools could teach the common activities of life for the purpose of training a person how to live, and to procure the mental training and application of it at the same time.

I should not eliminate the prevailing subjects from the schools. Progress must come by a gradual process of evolution. The schools are teaching in an elementary way the things that colleges and universities have taught, I mean to patch the new ideas on and on, until finally the patch will be the larger part of the garment. If we were to begin the schools all over again, of course, we should begin with the locality and the affairs of it and let the children grow out to the other affairs as they develop. The school should represent its place and its station, and then the exterior subjects should come as fast as the child has the ability and the school has the reach. I would not eliminate mathematics. They come as part of the process. The study of arithmetic is not an end in itself. It is merely a means of working out some of the conceptions of life.

But I wish to say something about religion. It is on my mind because the demands from churches and religious bodies, young men's Christian associations and other organizations is now very great. They are beginning to feel the call to more than they have done for the country life situation. I assume in the beginning that the mission of the church is to preach the gospel. What I have to say therefore is aside from that question. It is sometimes said that the school is going to be the center of rural communities. I doubt it. I believe that some institution of religion is going to be one of the social centers in the end. That you may get my thought, let me say that whatever our theory or philosophy of life may be, everyone of us begins where Genesis begins, "in the beginning, God." Well then, if the earth is God's handiwork, it is holy; and if the earth is holy then all the things that grow out of it they also are holy; and if the materials are holy, then all the good, honest, constructive effort put into the development of materials is holy. Now, no farmer in the last analysis, owns his land, not even in Lancaster county, Pennsylvania. A man does not take it with him into the next world. Society, that is, government, allows a man as the agent of society to hold a piece of land, and for two things: that he may make a living from it, and that he may help the rest of us to live. He produces more wheat than he wants, and the loaves of bread are for the rest of mankind. The remainder of us cannot live on the earth unless the farmer produces more than he wants.

Farming is a quasi-public business, and will be so recognized in time to come. The earth is holy, and it belongs to all the people. The farmer is the agent of society, or the people, to use land for the good of us all, as well as for the good of himself. No man has a right to skin the surface of the earth. Good farming is at the foundation a religious business. No, it may not have been necessary in times past, when society has been unadjusted, for persons to skin the land in order to be able to live. If so, society has been at fault. That will not be so true in the future. Every man who tills land owes a responsibility to society and to God for the use that he makes of it. Now, farming is at the bottom of our whole economics and social structure, because it provides the materials of subsistence. It is more important that the farmer has a religious reaction than that any other man whatever have such a reaction. Now, every person is fundamentally religious. The religious impulse must be developed or educated. It is the function of some organization to develop it. It is at present the function of the organization called the church. Here I come to the rural church. The contact of the rural church with the agricultural situation, if it is to meet its responsibilities, is absolutely fundamental and it cannot be evaded.

Now I hope that I have put into your minds a conception of the elementary character and position of the man who stands on the land. I am not complimenting the farmers. They do not need compliments. The time was when people complimented farmers. The time has come when public men criticize farmers just as they criticize anybody else, and the farmer does not resent it. What we need to do is to tell the truth and let the situation work itself out.

The CHAIRMAN: The next on the program is an address by Dr. Thomas F. Hunt, Dean of the Experiment Station, State College, Pa., on "Observations on German Agriculture," illustrated with lantern slides. I now have the pleasure of introducing Dr. Hunt to you.

DR. HUNT: Chairman, Ladies and Gentlemen: Just before I got up to make this talk Mr. Harmon said: "I can give you a pointer. After that address that was given by Prof. Bailey you better keep still." I think he is quite right, for as a matter of fact I am like the man who got up in response to a toast. He said: "Now I prepared that toast. I spent a great deal of time on it and I prepared it with great secrecy. Only God and myself knew what was in the remarks I was going to make. Now only God nows." I was carried away with the address we have all listened to and we have all enjoyed so much that I hardly know what I am to say.

Dr. Hunt then delivered his address as follows:

OBSERVATIONS ON GERMAN AGRICULTURE.

By DR. THOMAS F. HUNT, *State College, Pa.*

Returning from a vacation of eight months on the continent of Europe, I had made up my mind that I would not undertake to discuss European agriculture at least until the subject had had time to assume its proper perspective. Eight months is too short a time to understand the genius of any foreign country, let alone six foreign countries which we visited. Upon reaching my desk, however, I found that Mr. Martin, Director of Institutes, had been promised that I would give an address at this meeting, and that he had especially asked that I give some account of European agriculture. This evening I shall confine myself wholly to observations on German and Swiss agriculture. These are just such observations as any one might make traveling by train through any country. They are merely car-window observations.

The first thing that will impress an American traveler through Germany is the lack of country life as we understand it. The farmers of Germany live largely in farm villages. (See Fig. 1). The farm village of Grenshof, near Heidelberg, is but one of the thousands of

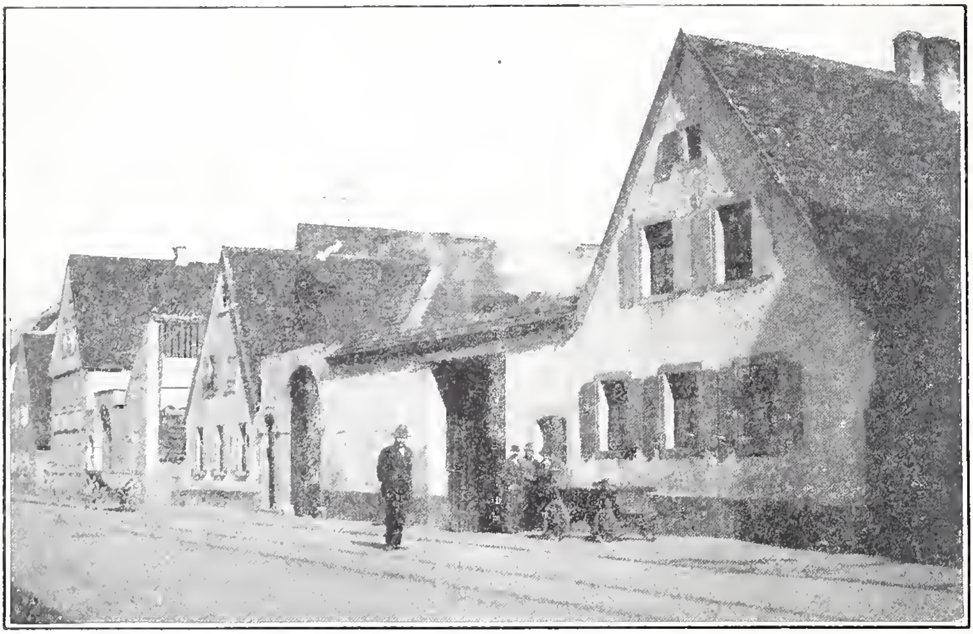


Fig. 1. A street in the German farm village of Edingen, near Heidelberg. Inside the door, where the men are standing, spelt is being threshed by steam power. There were about ten men engaged and it is estimated that they were threshing from five to ten bushels per hour.

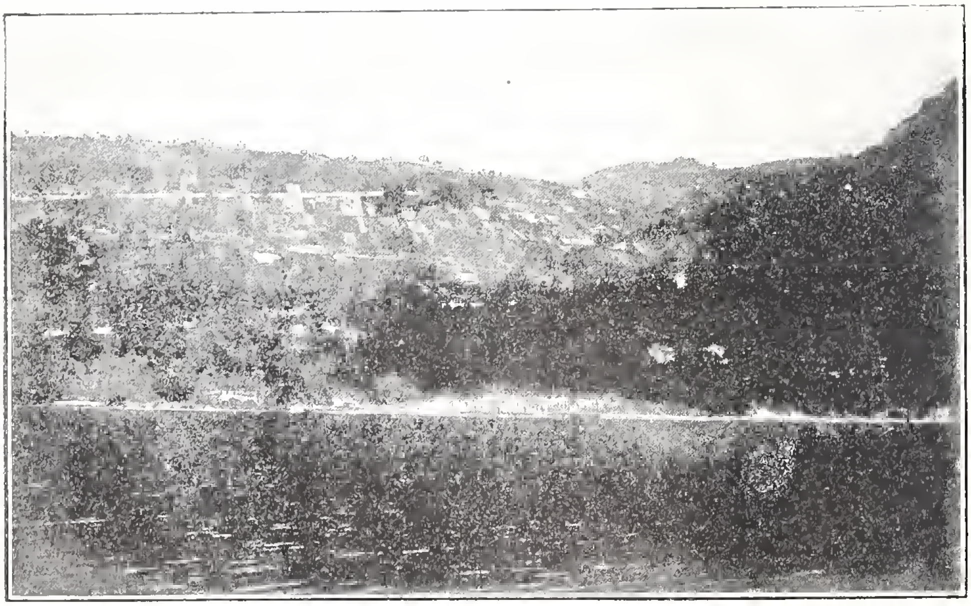


Fig. 2. Cultivated slope at Guten, Lake Thun, showing ribbon-like appearance of the country.

such villages. This little village consists of about two dozen homes built in a solid rectangle facing a little park or inner court. The houses all face this court and the entrance is at one corner, so constructed that when this entrance is closed there is no possible entrance to the village or to the houses. About half a mile away there was a well-kept cemetery, showing that the people who lived in the village were well-to-do people. This little farm village reminds one of an oasis in a desert, except that it was in the center of a fertile and intensely cultivated plain. On another day I walked from Norsingen to Wengen, two miles; from Wengen to Shalstat, three miles; and from Shalstat to St. Georgian, three miles. Between these villages there was neither house nor fence, but hundreds of people earned their living from the fertile soil. Doubtless, there is more than one reason for the farm villages and for the lack of country life, but everywhere one goes in Europe, whether in the villages, towns or the great cities, he is impressed with the fact that a man's house is his castle. As Mr. John Burroughs says: "Paradoxical as it may seem, the city is older than the country. Truly man made the city. After he became sufficiently civilized, not afraid of solitude, and knew on what terms to live with Nature, God permitted him to live in the country. The necessity of defense and fear of enemies built the first city; built Rome, Athens, Carthage and Paris. The weaker the law, the stronger the city. After Cain slew Abel he went out and built a city, and murder or fear of murder; robbery or fear of robbery have built most of the cities since."

Even in the larger towns to-day a stranger rings the bell at the gate. The latter is usually locked at night. Is the present day custom the result of tradition, social exclusiveness, or fear? As recently as 1870 blood ran in the streets of many of the towns and villages of France and Germany, and the inhabitants suffered the evils which always follow war. At present Europe is an armed camp. One can not escape the feeling that the people believe that they are safer to-day behind solid brick or stone walls and iron gates. However, not all the sections practice the village system. In some places scattered farmhouses are to be found. They are more common in Switzerland than in Germany. That Switzerland has a Republican form of government is perhaps not without its significance in this connection.

One of the great surprises to me in visiting Europe was the relatively large amount of level open country. Perhaps you have not made this mistake, but I had supposed that Europe was a rough and often mountainous country on which it was not possible to use to advantage modern agricultural machinery such as we employ so exclusively in America. The reason for this impression grows out of the fact that it is almost impossible to take a satisfactory picture of a level stretch of the country, and out of the further fact that travelers generally are not interested in the level tracts but hurry through them to what they consider the more beautiful mountain scenery. It is comparatively easy to take pictures of the mountains, and thus Americans see many illustrations of mountain scenery but scarcely none of the level areas.

The next thing which will impress the observer from the car-window is the ribbon-like appearance of the country, due to the fact that the land is divided into small rectangular plots. If one looks out over these intensely cultivated areas it looks just as though the land were covered with large numbers of different colored ribbons. The picture shows a mountain side. (See Fig. 2). I was able to get the picture from the steamboat because the land was on a mountain side. When in the level sections, however, which are much more characteristic, it is almost impossible to get any photographs of the country which would given an idea of what the traveler sees.

Figure 3 shows the plots rather than the hop holes. The plot on which the hop holes stand is about 450 feet long and 30 feet wide. On the left is a strip of clover, and on the right a strip of volunteer grass, and next to this a strip of vetch. From the point where this picture was taken hundreds of acres could be seen which were laid off in plots with road-ways at the ends, and looked for all the world like a mammoth American Experiment Station. For miles in every direction the land was divided into similar areas. There were no fences, and, as previously explained, the people all live in farm villages.

In some parts of Germany, the sub-division of the land through inheritance, or otherwise, has gone on to such an extent that the Government has stepped in and by law re-distributed the land. As it is now, one man may own a dozen of these little tracts of land in various parts of the region in which he lives. The Government has in some cases re-distributed the land so that he should have all his land in one tract.

An incident occurred at the Agricultural Experiment Station at Bonn, Germany, which will illustrate the intensive character of some of the farming. I was shown some experiments in transplanting rye. It was explained that if rye is transplanted at just the right time, and planted a little deeper than it grew originally, the yield would be increased. The question on which they were experimenting was to find just what was the best time in the growth of the plant to transplant it. "Well," I said, "what of it? After you have made the discovery will it be of any practical importance?" The reply was, the smaller land owners could make use of it."

After looking over the beautiful, level, fertile areas, without a fence or a house for miles, every inch of which, except for the roadways, is under cultivation, I could not help wondering what an Iowa or a South Dakota farmer could do on that land if he would go in there with modern American machinery. There is no more difficulty in cultivating the land in 80-acre or 800-acre tracts than there is in South Dakota, except the separate ownership. Ownership is an artificial condition. It seemed to me that the natural conditions must prevail; the artificial conditions must give way. Later, however, I visited a farm of 300 acres conducted very much as an American farm is conducted. Here I found Polish women being used to pull the sugar beets. There is a law in Germany, as in this country, against contract labor; but they found it necessary, in order that crops on these large farms may be harvested, to allow the bringing in of Polish laborers during the harvest season. These people can only live in Germany six months, and then must be returned to Poland. I asked why they used women instead of men, and they said because it was cheaper. In other words, the Germans find it impossible to employ native labor cheaply enough to produce sugar in competition with other countries, or with the small land owners. After seeing this farm, I concluded that I would not try to reform the German Land System.

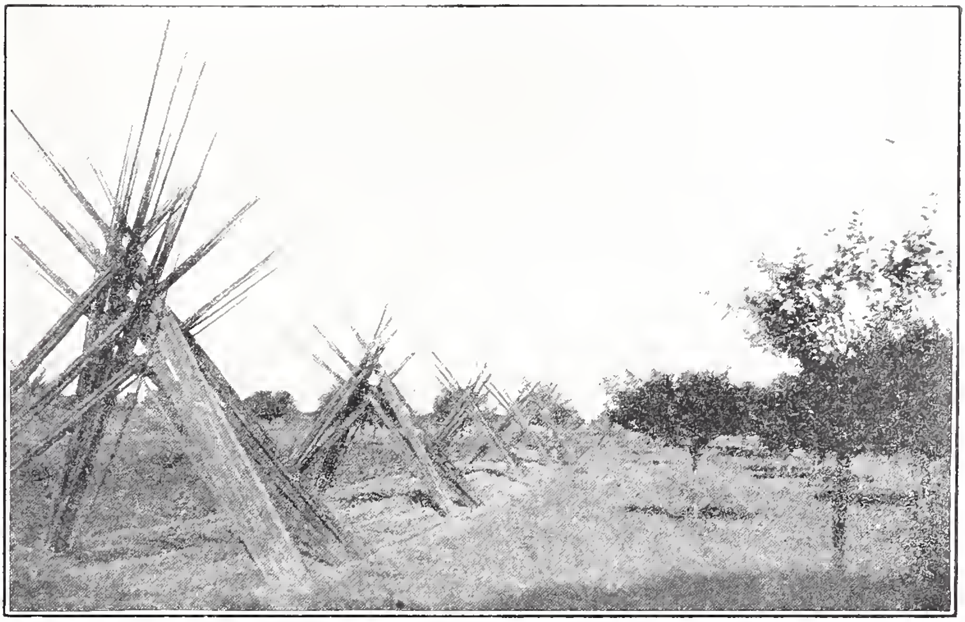


Fig. 3. Photograph showing method of dividing land into small rectangular areas.

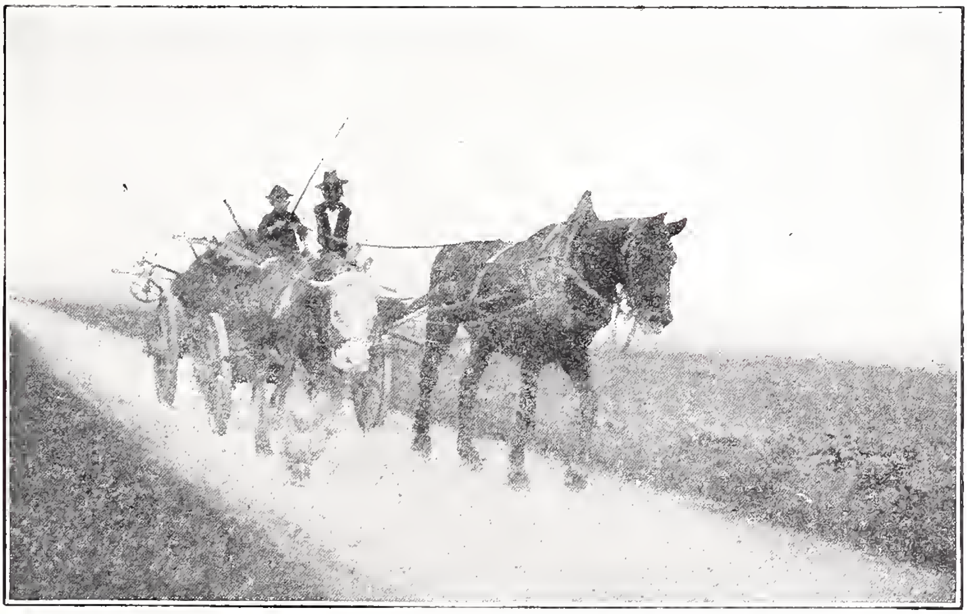


Fig. 4. Horse and steer used together in Southern Germany. This roadway connects two small farm villages. It is not a high-way; it is a by-way.

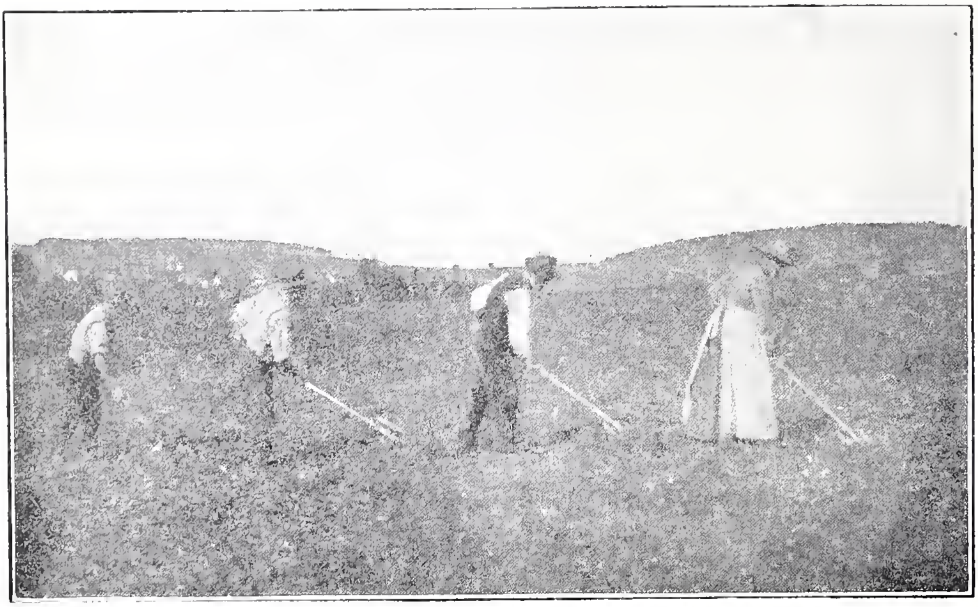


Fig. 5. Tedding hay near Zurich, Switzerland, illustrating large amount of hand labor.

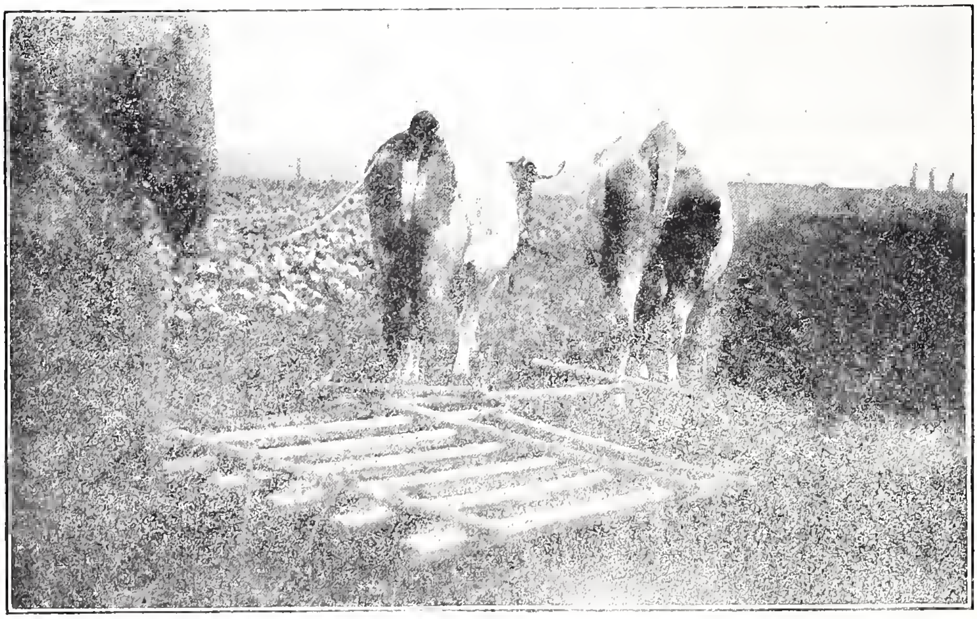


Fig. 6. Two cows hitched to typical harrow, Southern Germany.

Another thing which will impress the traveler in Europe, and the longer he stays and the more he gets in to the by-ways, the more he will be astonished and impressed. I refer to the good roads. Everywhere in Europe the high-ways are veritable boulevards, and the by-ways are similar to the road as shown in Fig. 4. In Europe they do not know what a thank-you-ma'am. If you investigate the matter you will also be surprised at the comparatively recent character of many of these road-ways. France, for example, has been inhabited more or less exclusively for eighteen or nineteen centuries. At the beginning of the nineteenth century France had 30,000 miles of road-way; the close of the century she had 300,000 miles of road-way, which would probably average as good as the one shown in this picture. During the same period of time, the raw agricultural products have increased in value from three billion francs to nine billion francs. No one, of course, would for a moment claim that the increased value of agricultural products in France was merely the result of good roads, but it is incontestable that the good roads of France are a factor in her increased well-being.

The next thing that will impress the hurried traveler is the general lack of improved farm machinery. I passed through Germany during the fall haying season. Everywhere men and women were working in the hay fields, (See Fig. 5) and in all Europe I saw just three mowing machines at work. I saw two horse hay-rakes, but only one of them was in use. Everywhere you see men mowing grass with a scythe, and women raking with a hand rake.

Necessarily a correlative to the lack of modern farm machinery is a large amount of hand labor. Women work in the fields quite as frequently as the men. I was shown into a barn in Southern Germany where five persons were running a steam threshing machine, and every person was a woman. The hurried traveler is very likely to conclude from what he sees that in Germany men wear uniforms and the women do the work, and I am afraid he is about half right. At any rate I have said, half seriously, that I believe Germany would starve to death if it were not for the severe toil of its women.

The employment of other animals than horses for traction purposes is another of the significant features of Europe. During a walk in Southern Germany, I estimated that of the animals used in farm work about one-third were horses, one-third steers, and one-third cows.

While Fig. 7 shows a very common form and size of cart in Germany, attention should be called to the fact that immense carts, drawn by single draft horses, are also not uncommon. In some cases a single horse is said to move, on two wheels, six tons. Instead of criticising or being amused at the use of dogs, (See Fig. 7) or cows, or donkeys or even man-power, we should learn a lesson from the experience of these older countries. The facts are, it seems to me, that in many ways the problem of transportation is better worked out in Europe than it is in our own country, and one of the factors is the adaptation of power to the economic need. It is not good economy to run a 50-horse power boiler and engine when only 5-horse power is needed. The dog, the donkey, the cow, and the steer finds a place in Europe along the side of the most modern up-to-date methods of transportation because each serves present economic needs.

If the traveler will descend from the train, and go out into the fields, he will be impressed with the tremendous fertility of the soil in many places. I saw land in Europe that had been cultivated for twenty centuries that is as fertile as any land in America. The Rhein Valley, between Freeburg and Frankfurt, had been farmed for the last 1,200 years. It raises two crops which contribute largely to that fertility, viz.; Alfalfa and mangel-wurzel or stock beets. The alfalfa furnishes succulent and protein food for livestock and keeps up the nitrogen supply of the soil, while the mangel-wurzel takes the place of our Indian corn. As a matter of fact,. mangel-wurzels are watered-concentrates, so that with alfalfa and these stock beets the farmer has two ideal crops, both from the standpoint of milk production and of keeping up the fertility of the soil.

In addition to this Germany has, as America well knows at moment, the potash supply of the world. Thus, the German farmer has a cheap supply of potash, and by means of its basic slag it has supplies of phosphoric acid in one of the best known forms.

In view of all that has been said of the lack of farm machinery in Germany, and what seems to an American the primitive methods of farming, one must not fail to call attention to the general prosperity of the German farmer. To the casual observer it is a puzzling fact, for not only are the people in German cities prosperous, but the German farmer appears prosperous. When one studies it seems almost impossible that it should be so. I talked with a young Canadian, who spent three years in Europe studing History and Political Economy, concerning these conditions. His explanation was as follows: "America exported agricultural products and imported manufactured products, therefore, our tariff system protected the industries rather than agriculture. That perhaps in America, with its fresh lands and farm machinery, they could carry this burden for the benefit of the industrial classes without feeling it." In Germany, however, he claimed the situation was just the reverse. Germany imports agricultural products, competing in the world's markets with its manufactured products. Now, he said, when a country competes with other nations of the world for a market, its protective tariff system is of no avail. On the other hand, he claimed, that science, as applied to industry, had reached the highest development of any country in the world, and the industries could afford to be taxed for the support of the farmers of Germany. In other words, he claimed, that the protective tariff in Germany made the farmer more prosperous; while in America it made the manufacturer more prosperous. This gentleman was a Canadian, and consequently looked at those things somewhat differently from those who live under a protective tariff. He did not state the problem fully. The German Scientist has calculated, it is said, just how many more people can be supported on the farms of Germany if the crops which are raised are fed to livestock, and the manure put back on the land, then if the crops were sold.

The German Emperor is in favor of keeping the largest possible population upon the farms, because it means for him a strong army and a strong navy. The German Government, therefore, maintains a fiscal system which promotes the keeping of domestic animals, and to offset the burden which the industries must carry, in connection with this fiscal system, applies the highest scientific intelligence to its industrial enterprises.

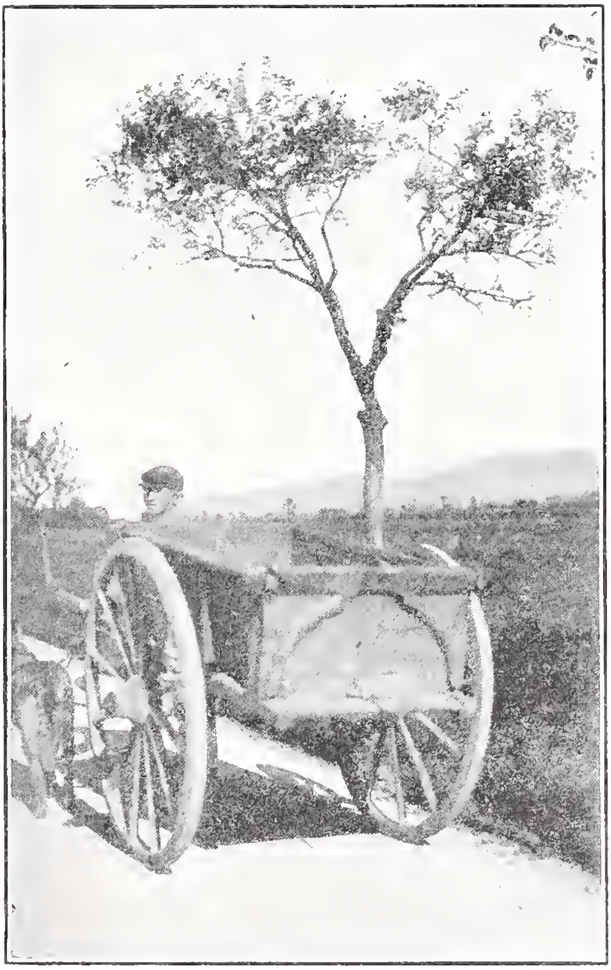


Fig. 7. Common hand cart drawn by boy and dog.

There is one further impression which has ripened up in my mind since I have visited Europe. I find that I have been giving too much emphasis to our natural resources. I have given too large a place to the advantage which we derive from the fact that we are a comparatively new country. No one will seek to deny that we have great natural resources, or deny that we should conserve these natural resources in every possible way; but, it seems to me, that the agricultural possibilities of France are to-day as great as any similar area in America of which I have any knowledge. A former Consul to Canada from Argentina once said to me; "I do not look upon the United States as a nation, I look upon it as a new civilization." I did not then understand what he meant, but I think now I have some notion of it. The fundamental reason for America's prosperity does not lie so much in its natural resources as in its civilization. I have, therefore, come to believe as I never believed before that this country-life-movemnt, of which Director Bailey has spoken to-night, is the most important problem which we have to face. We can not rest upon our natural resources; if our children are to inherit the earth, progress is necessary.

The CHAIRMAN: This closes the evening's program, and to-morrow morning we have a very extended program in which horticulture will be the chief subject. The meeting stands adjourned until 9.30 o'clock to-morrow morning.

Wednesday Morning, May 24, 1911, 9.30 o'clock.

Mr. J. W. Stewart in the Chair.

The CHAIRMAN: The Chair certainly desires that this session be one of the most profitable and interesting sessions of this series of meetings. If we have not yet reached the climax, we desire to move in that direction during this session. We have an important and interesting branch of agriculture to be discussed in your hearing this morning. We have no doubt that the gentlemen who will address you are full of enthusiasm, full of facts and full of entertainment for you, and it seems to me, surrounded as we are, that we are all in the frame of mind to make this an interesting and profitable session. If there is no other business at this period we will proceed with what you find upon the program.

DEPUTY SECRETARY MARTIN: With your permission, I would like to offer a remark. Gentlemen attending this convention who have not registered will please report at the intermission their names and be registered. Time is too limited to permit us to have a recall of the roll. Please bear that in mind as it is very important that we get the names and address of all the delegates and all visitors.

The CHAIRMAN: We have three discussions, ladies and gentlemen, upon this program and we will divide the time if satisfactory to all as nearly as possible between these three speakers. I have the pleasure of introducing to you Mr. Chester J. Tyson, Floradale, Pa., who will discuss the "Handling of the Apple Crop."

MR. TYSON: Mr. Chairman, Ladies and Gentlemen: After hearing the addresses last night I was brought somewhat to feel that what I have prepared to bring before you might apply more especially to a gathering of growers than to a gathering of teachers, but in thinking the matter over further I believe that if what I have to say is worth anything to growers and handlers of fruit, it may also be of value to those who are going out through the State to teach those growers and handlers of fruit the things they should know.

Mr. Tyson then presented his address as follows:

HANDLING THE APPLE CROP.

By C. J. TYSON, *Floradale, Pa.*

Before taking up the handling of the apple crop, as is my purpose to do, I would say that I consider this one of the most profitable crops to be grown on the farm; a crop, to the growing of which, many parts of our State are well suited. Five hundred to one thousand dollars per acre are not unusual gross returns, giving net figures of more than fifty per cent. of these amounts. One eleven-year old Pennsylvania orchard, last year, returned over $250.00 per acre: this on a 40-acre area. Another ochard twelve years old, gave nearly $400.00 per acre. We hear stories of the large profits from orchards on the Pacific coast, where good orchard land is selling around $1,000.00 per acre. The figures given above were realized in our own State of Pennsylvania, on land that a few years ago could have been bought for $50.00 to $75.00 per acre. Not a particle better than thousands of other acres in the State that may still be bought at these prices, or less.

I hear some persons saying that too many trees are being planted, and that very soon there will be no market for the great quantity of apples produced. There need be no immediate fear of over-production so long as we devote ourselves to growing only good fruit. Someone has said: "Apples will not be over-produced until every man, woman and child in the land has all the apples he can use, and gets them at a moderate price." I believe that condition to be very far remote.

Handling the apple crop for home use probably need not be considered here, except that care against bruising, and protection from evaporation will add much to apples intended for home consumption.

Apples wrapped in paper will keep much better than when not wrapped. This is particularly true with high quality apples of the Grimes Golden, Jonathan, Stayman Winesap type.

We shall consider the matter then from a commercial point of view; and for this purpose, the orchard interests in any place should be on a fairly large scale to give most satisfactory returns. I mean by this, than an acre of orchard here, and another there, remote from other interests, will probably be disappointing, unless a strictly retail trade is to be supplied. There should be enough trees in a place to produce at least one carload; and from that point up, the selling conditions will improve as the quantity increases. The reason for this is very plain. Many of us prefer to sell our fruit and produce for cash at the loading station. The largest and best cash buyers go only to neighborhoods where large quantities of fruit or produce can be bought, for the reason that expense of looking after small lots is too great, consequently competition is greater, and better prices almost invariably are paid where fruit is plentiful. I therefore recommend that fruit growing be conducted either on a large scale by individuals, or by a community of small growers. Handling the apple crop is clean, pleasant work, which anyone may engage in honorably. It affords opportunity for careful, painstaking effort, and plenty of employment for the brains of the operator.

In the first place, we shall assume that the fruit has been well-grown; that the trees have been pruned, so that each limb and branch has room to bear its load of fruit without crowding or seriously shading any other loaded branch, the centers open to admit sunlight, and a free passage of air; that the tree and fruit have been carefully and thoroughly sprayed for scale, if that pest is present, for codling moth, which is always present, and for the many fungus troubles of fruit and foliage; that the trees have been well fed with a ration balanced to meet their needs—a matter which only experiment in your own orchard will decide; that the question of moisture has been carefully seen to in the orchard by thorough cultivation where conditions will permit, or by heavy mulching where the ground is too steep for cultivation; and that the fruit has been thinned when trees have set an overload. This is a practice not generally followed in the East, and yet when thinning will increase the value of apples fifty per cent., which the past season has proven, we may well look into it. Thinning not only improves the size, but removes a working place for insects and fungi, which operate between close-hanging fruits.

Shortly before starting to pick, all dropped fruit should be gathered from the ground, and removed—partly to save it from decay and trampling by the pickers, and partly that the later falling fruit shall not be mixed with it.

Do not pick the apples too early. To my knowledge thousands of barrels of apples are each year hurried from the trees and into market in a green and immature condition, which interferes with selling at full prices, and even affects the keeping quality of the fruit. Apples should hang on the trees until they have attained nearly the full normal color for the variety, and until they can be picked without pulling out stems or breaking off fruit spurs. Good, full color adds almost one-half to the market value of an apple. This is not entirely a matter of looks, either, for the consumer has learned that the matured apple has a greater amount of sugar, consequently, better flavor, than a green one.

Apples that are mature and well colored are found to scald in storage much less readily than immature fruit. In this connection many growers overlook the fact that apples grow wonderfully in the last ten days before full maturity, adding bushels every day that they so hang; much more than balancing the small loss that may occur from dropping.

At this point we must consider the package. Large quantities of western apples have been coming to our markets in boxes, holding about a bushel. In most of these boxed shipments each apple is carefully wrapped and placed in the box by hand. Other shippers do not wrap; and still others lay a face only and pour in the balance of the apples. Some eastern growers have tried box-packing in the past few years, and are finding it decidely profitable. I strongly recommend that more of our growers look into this method and try it, at least in a small way. Personally I have had but limited experience in box-packing, and shall not attempt any extended discussion of the process.

I must acknowledge that I do not share the opinion of some public speakers and many writers, that the time is fast approaching when the box will entirely replace the barrel as a package for apples. Indeed I question whether the proportion of boxes to barrels will ever become much greater than in the past season.

Owing to the greater cost of box-packing, this method is not profitable except in case of the best grades of fruit. Not all apples are good enough for box-packing, and must be handled in some other way. Moreover, box-packing is slower; and in the rush of handling a large crop, it is not always practical, on account of time. Then, too, certain trade demands apples in barrels, even the best grades. Especially is this true of the Southern trade, which is now taking a great many Pennsylvania apples.

The box has its place with the consumer who wishes to buy only about one bushel of apples at a time, either through regular trade channels or direct from the grower. This trade will undoubtedly grow, but probably not out of proportion to the regular trade in barreled apples. Many dealers who formerly bought boxed apples, because of the uncertainty of barreled fruit, are learning that there are growers of apples whose brands can be relied upon, and are now buying eastern grown apples in barrels. They can get an equal value at a lower price.

Do not understand me to say that I favor packing poor apples in barrels, for I most emphatically do not. Poor stuff, barreled and put up regularly on the market, in competition with good apples, has a demoralizing effect on the whole market. The apple trade of the season of 1907-08 was a very good illustration of this point, where an already weak market was completely destroyed by being flooded with thousands of barrels of poor apples. Similar conditions seriously hurt the market the following season. In fact, certain sections have gained such a reputation for barreling poor fruit that many years of fair dealing will be required to set them right with buyers of apples.

It is much better to sell these low grades locally, if possible, to supply the small town trade from wagon, if the supply is small; or, if the quantity is great, sell to cannery, fruit evaporator, or cider-mill. If none of these give a satisfactory outlet, load the second grade stuff in bulk cars and ship in that way. In recent years the market for bulk apples has come to be a regular thing, and much of the cheap trade in the cities is supplied in that way, without adding cost of barrel package.

If two or more varieties of apples are to be shipped loose in the same car, it is very important that they be divided by a wooden partition. Attention to this point will often add one-third to the returns from the car.

The ideal solution of this poor grade problem is, of course, to grow up no low grade fruit, and we have not secured the best that our business affords until we have closely approached this ideal. Lack of thoroughness in the things we already know is the reason why most of us fall short in this respect.

In barrels, as in other packing, we should have in mind the safe and satisfactory arrival of the fruit in the hands of the consumer or retailer, not only its passage from our hands in exchange for a sum of money. For, if we are in the fruit business to stay, either as grower or dealer, no other kind of advertisement will go as far, or carry so much weight, as well-graded and well-packed fruit, plainly branded with the name and address of packer.

Then let us see that the fruit is handled carefully. It is not always possible for us to control this matter absolutely; but it should be watched all along the line.

Half-bushel, drop handle baskets, each provided with a light iron hook to hang from ladder step or limb, will bruise the apples much less than when picked into a bag. There are two reasons for this; first, in the basket the apples lie where they fall, while in a bag they are constantly moving over each other with every motion of the picker's body, resulting in many slight bruises, not noticeable in many varieties, perhaps never in Ben Davis; but in most kinds detracting greatly from the appearance of the fruit after being stored a little while. Then, nearly always a few apples in such bag are bruised between the picker's body and the ladder steps or limbs of the tree, to such an extent that they must be discarded at once. I have had an opportunity to watch this matter very carefully and it does work out.

In picking apples, where trees are not too high, I like a step ladder. A convenient height is eight or ten feet, and the ladder should be made with but three legs, so as to stand solidly on uneven ground. For high trees I use a ladder, the side rails of which come together in a point at the top. This ladder can be pushed up between branches without knocking off fruit, and requires but one point of support at the upper end. In picking apples from a tree heavily loaded with green fruit on the under side of limbs, I am satisfied that it is entirely practical to make two pickings; and that the green apples, left ten days or two weeks, will improve enough in size and color to pay well for the extra work. Picking should begin on the lowest limbs, and proceed upward. This saves many apples from being knocked to the ground by pickers.

For barrel packing, if at all possible, the fruit should go directly from tree to a packing or sorting table, and at once enter the barrel. If, for any reason, this cannot be done, another course is open. Either pour carefully into bushel crates or into the barrels, which are to be used later. Remove the heads and place them in the bottom of the barrel; and lay a corrugated cap or paper cushion on top of the head, to prevent cutting of the fruit. Then haul to the barn or packing shed, and store till ready to barrel. In this way all the available help may be employed in picking; and the packing may be done on rainy days. Neither boxes nor barrels should be made quite full.

Never, except under the most extreme necessity, pour into piles on the ground. This will mean unnecessary bruising, a good deal of decay and a lot more work every time.

The sorting table may be made in several ways. My preference is for a frame of three by four stuff, six feet long by three feet wide, and covered with burlap, canvas, old carpet, or any strong material which will form the bottom of the table; faced all round with a board, which extends an inch above the frame, to form an edge. This edge, with the sag of canvas cover, gives capacity for two or three barrels of apples. The table is supported by two trestles or by three barrels. It stands as nearly level as may be, and each apple must be picked from the table by hand. The operation is not a slow one. The operator, looking before him sees one side of the fruit. He takes two apples in each hand, (unless very large) and turns up the other side, then, with a quick motion of the fingers, the grades are readily divided into their respective baskets, at side and end of table. For this purpose a round half-bushel, drop handle basket is best. This basket can be lowered to the bottom of the barrel and then turned over by hand. I like this method, because I belive more thorough culling and better grading can be accomplished with less bruises than with any other form of table.

Use good barrels, of full standard size, head 17½ inches, bulge circumference 64 inches, length of stave 28½ inches. This is the standard New York apple barrel, and contains 7.026 cubic inches.

If possible, get barrels made from well dried staves, by expert coopers. Green staves will dry out after filling, and leave the barrels loose, while poorly made barrels will result in much vexatious delay at a time when every moment must be made to count. The importance of a neat substantial package is often overlooked. Avoid barrels made with sawed staves, which gather dirt from the time they leave the cooper; and often arrive at market in a dingy condition. Insist, also, upon cut hoops of good quality, and upon clean white heading, preferably of some rather hard wood.

See that the croze, or groove, is cut to a good depth, and yet that the ends of the staves are not cut off. Chestnut staves make a good, substantial barrel and are my preference. Elm is substantial and looks well; but beware of willow, cottonwood, or any similar soft material for staves. I speak strongly on this point, having had some costly experience.

The next operation is to cooper the barrel. Turn up the face or head end, drive down the quarter hoop and put in two nails; tighten the end hoop, and drive four nails, starting the nails near the upper edge of the hoop and slanting them well toward the ends of the heading. Use 1½ inch polished cut nails for this purpose. Nail head-liners, which have first been soaked in water, across the ends of the heading, using three or four ¾ inch polished cut nails to each liner. Some persons do not use head-liners, but it gives the barrel a more substantial appearance and is required on export apples before they will be accepted by vessels at point of loading. A good deal of annoyance will be avoided if liners are of good, tough material. Elm is probably best with one edge rounded.

Liners need not be more than twelve inches long, greater length being harder to put in place. Now, reverse the barrel, drive down and nail the other quarter hoop; loosen the top hoop and remove the head. Next comes the facing or lining paper, to protect the face of the apples from bruises and dirt. It may be a corrugated cardboard cap, laid with smooth side next to apples; or it may be a simple white paper cap, which keeps out dust and looks neat when the barrel is opened. Handsome red fruit shows up nicely when a lace paper circle is used.

I believe in facing the barrel. When properly done it has the same effect as a neat package or a handsome label. It helps to give the purchaser a good first impression. The apples in the "face" should be clean, bright specimens of about average size for the barrel. Unfortunately, the practice of facing is often abused, all of the fine large specimens being selected for this purpose, and the balance of the barrel filled with poor apples. In such cases the purpose is entirely one of deception, and the good first impression gives away almost at once to a feeling of anger and disgust, and a determination to buy no more of your fruit.

The face should be laid in rings, beginning at the outside of the barrel, and should be fitted as firmly as possible. A second layer is usually placed by hand; then a basketful is turned on top to hold the face from shaking. At this point, or sooner, the barrel should be stood on a solid plank about a foot wide and two inches thick. As each subsequent basket of apples is emptied, the barrel should be well jarred down on the plank. When the barrel is full the top should be leveled off and a ring of apples laid around the edge of the barrel. If the apples have been thoroughly jarred down throughout the filling it will not be necessary for the barrel to be filled much above the level of the staves. A cushion head will help greatly in leveling and settling down the apples.

Putting in the head is the next operation, and for this purpose I much prefer a screw press. It settles the apples gradually and allows free use of both hands. This end also is nailed with four cut nails and secured with liners.

The barrel is then turned back and stenciled with the variety name. In addition to this the packer should be willing to stand back of his work, and should express this willingness by plainly branding each barrel with his name and address. I have followed this practice for several years and have found the results very satisfactory. This means that nothing must go into the barrel that will fail to give value to the man that pays his money for it.

The CHAIRMAN: Members of the Institute, at this period of our meeting there is to be a resolution offered by someone. We will now hear that resolution.

MR. LIGHTY: The resolution that I have will interest every one of us. It reads as follows:

"The Township Road Bill passed in 1909 is a contract between the State and townships, whereby the State pledged aid to an amount not exceeding twenty dollars per mile and we expect that contract to be carried out. Any other action would discourage and retard the good road movment. To carry out this contract will require about one and one half million dollars a year. We insist that this appropriation be inserted in the Jones Road Bill."

The CHAIRMAN: Members of the Institute, for want of time we will have to forego a discussion of this resolution.

MR. LIGHTY: Mr. Chairman, I move that this resolution be adopted as read.

MR. BARNES: I second the motion.

The motion was put and resolution adopted as read.

MR. BLYHOLDER: Mr. Chairman, I move you that a copy of this resolution be forwarded at once to the Legislature.

DR. CONARD: I second the motion.

The motion was put and agreed to.

MR. BAYARD: I hope your secretary will insert the names of the President of the Senate and Speaker of the House, Chairmen of the Appropriation Committees in the Senate and House and our two senators at Washinton in his report.

I believe it is entirely worth while for members who have friends in the House and Senate at Harrisburg to communicate with them personally and very promptly. I think it is a matter that requires quick action.

DEPUTY SECRETARY MARTIN: I have great pleasure in introducing the Master of the State Grange, Hon. W. T. Creasy.

MR. CREASY: I came here this morning from Harrisburg and I went there particularly in the interest of the dirt roads of Pennsylvania, and in looking over the situation at Harrisburg I thought prompt action was necessary to do something to stiffen up the backs of those Senators who are so much afraid of making any appropriation to our township dirt roads. Now I have studied the road problem for years and I find out in the State of New York they have improved 60,000 miles of dirt roads within the last six years under what we call a bill similar to the Jones Township Road Bill. The impression at Harrisburg has gone out that that the farmers of the State don't know anything about building roads. I will not discuss that here, but I do say this; that if we want roads we will have to fall back on our township supervisors to build those roads, build right to our market towns and railroad stations and to our county seats, the roads that the farmers are particularly interested in. Now we passed a bill in 1909 that promised to give 50 per cent. of the amount of money we raised in cash, not exceeding $20.00 a mile. The contract is a law on the statute books of Pennsylvania and what we want to do is to have it carried out, and it will require $1,500,000 a year, and I believe that this telegram sent to the persons that have been named by Mr. Bayard of the National Stockman will bring the desired results, and I am pleased to see that this convention has passed the proposition. The Pennsylvania State Grange is working hand in hand with the Pennsylvania Farmers' Institute to advance agriculture and I believe your work has been of great benefit to the State and our interests are mutual.

I am pleased to be with you, but I am particularly interested just now in the legislation going on at Harrisburg, because the farmers to build the roads as they should be built are unable to do so, especially in our poorer counties of the State. There may be a few exceptions. I am satisfied that after ten years trial, I am willing to back it up that after ten years trial of this dirt road proposition, if rightly carried out, it will give us more good roads than any other plan developed, and that is the verdict of the engineer in charge of the dirt roads in New York, that if they had not adopted that plan of State aid the highways would have gone by the board after the enormous expenses that were necessary to make them good after several years. So that I am satisfied with the men that understand this road proposition and the farmers who are particularly interested cannot receive any better help than this aid from the State which will only require about $1,500,000 a year and it is practically the only money we get from the State outside the school appropriations that is any benefit to the taxpayers of the State, and the revenues of the Pennsylvania have increased wonderfully within the last ten years. There is something like $30,000,000 a year coming from the corporate interests, which indirectly comes from us because the man that gets the freight in the end pays the bill, and so it is up to us to get some of that money and if we don't get it it is because we have not conducted this proposition as we should. I believe that if any of you men here are acquainted and know the senators and members of the House it will only cost a quarter and will do a lot of good to communicate with them. As long as we don't ask and let them know, they think it is all right. I urge you people to wire your senators and tell them what you want and they will listen. They are in a mood to listen both at Harrisburg and Washington, more than they have been for years.

The CHAIRMAN: If there is nothing further at this period of the meeting we will return to the regular program. We have some time to devote to questions on Mr. Tyson's address and are ready to hear your questions.

MR. DRAKE: I would like to ask Mr. Tyson to give us a good talk in regard to picking fruit. Have you had any trouble with the fingers checking the apple, the end of the fingers bruising the apples when they are picked off?

MR. TYSON: That is a mightly hard thing to control. If you are picking Ben Davis apples it does not matter. You cannot check them. But in picking Grimes Golden or in fact many other of the more tender varieties that show finger marks plainly it is very hard to get them picked without little bruises.

MR. DRAKE: I endeavored to teach my pickers to catch the apple with the heart of the hand instead of the end of the fingers, but it is so hard that they do not always do it.

MR. TYSON: That is the way to do that.

The CHAIRMAN: The next subject on the program is "A Fortune in 15 Years, and Fruit the Factor." This question was to have been discussed by Dr. J. H. Funk, of Boyertown, Pa. I understand he is not present but he has a substitute in the person of a young man who is said to be a "chip from the old block." I have the pleasure of introducing to you Mr. Sheldon Funk, his grandson.

Mr. Funk then addressed the Institute as follows.

A FORTUNE IN FIFTEEN YEARS, AND FRUIT THE FACTOR.

By SHELDON FUNK, *Boyertown, Pa.*

Mr. Martin has kindly asked me to say a few words on this subject, and the request coming so unexpected as it did has found me entirely unprepared to talk before such an assemblage as we have here this morning composed of the most prominent men in agriculture throughout this great old State of Pennsylvania; and being sandwiched in between Mr. Tyson, the apple king of Pennsylvania, one one side and Mr. Farnsworth, the peach king of Ohio, on the other side, I find myself not in the most pleasant position. I hope that you ladies and gentlemen who are so much older both in age and experience will pardon me for these meagre and very hasty remarks. In regards to my talking upon the subject of "A Fortune in 15 Years, and Fruit the Factor," that is entirely beyond me because I have not made a fortune and besides, being an unmarried man it has so fallen to my lot to receive the smiles of misfortune and not dame fortune.

Nevertheless, having been upon Dr. Funk's place during these particular 15 years and having been associated with him during this time I have become somewhat familiar with his methods and operations in building up a most successful fruit orchard, and it is about these experiences and these observations that I would ask you to bear with me this morning for a few minutes.

It is the concensus of opinion that apples are more profitable and are better adapted to the general conditions than are peaches. First, they don't require as careful a handling, and then again the possibility of being preserved for such a greater period of time it is not as easy to glut our markets. You all know, however, that it requires from twice to five times as long for the apple tree to come into bearing as the peach tree, and this period between the time that the apple tree is set and the time that you harvest your first fruit is the period which the majority of men of small means fear, and it is one of the problems that must be solved in the apple orchard, that problem of supporting the apple orchard until it comes into bearing. How grandfather solved that problem was by using peach fillers which came into bearing with us the third summer. I know a great many people claim, both in this State and other states, that it is better to use apple fillers than to use peach fillers. All well and good if they can solve that particular problem, then I say use apple fillers; but with us the placing of apple fillers paid practically nothing upon the investment. We support the peach trees by planting potatoes between the rows the first two years. After the second year we practice clean cultivation and cultivate constantly from the beginning of spring until the middle of July, depending on the weather conditions. In the apple orchard, however, owing to the fact that it is situated on a very steep hill we have thrown it into sod so as to prevent erosion.

Peaches so far have been very profitable with us. I cannot give you the exact figures for last year's operations. The prices were lower than in some preceding years, but I think I am safe in saying that the gross proceeds for the season averaged close to one dollar a basket. Our transportation charges are five cents. We have a good and easily accessible market in Reading. The picking, packing and hauling cost seven or eight cents. Although this prunning, thinning, spraying and cultivation costs considerable, you notwithstanding can easily see that there is still a very handsome profit on your investment. Grandfather has about 20 acres in apples. I think 14 or 15 years old and this last year he had close to 900 barrels which realized him about $5,000 together with the pickups and culls; so that you can see that there again is a very nice profit, and this orchard is just coming into its prime and this year there promises to be a greatly increased yield.

Now one of the chief reasons, in my mind, for this success is the fact that he thoroughly understands the fundamental principles of fruit culture and carries them out to the minutest detail. Many a time that good peach money went into that apple orchard and those trees had to be treated just right; they had to be nursed through babyhood until now they are becoming giants ready to bring forth their luscious fruit and pay back in golden sheckles for the careful treatment they received in younger days. And therein, gentlemen, lies the fact why there are so many failures not only in horticulture but in general farming as well. If we would become a successful horticulturist it is not sufficient that we know that if we put the tree into the ground and if it receive a fair supply of rain it will grow and produce a large tree and will bear beautiful fruit. No, we must know why that tree grows and how it grows. We must carefully keep trace of the statistics of this State and other states so that we may be able to determine when we wish to plant an orchard what kind or class of fruit is going to be in most demand in our locality.

After we have determined the class, we have to determine the particular varieties, the best adapted to our soil, climate and market conditions. We have got to know what kind of fertilizer to use to produce the maximum quantity of that fruit. We have got to prune, spray and cultivate it. In short, we have got to know all the fundamental principles covering the growth of that tree from the time it is a sapling until it reaches mature age; and when we know these we have a golden opportunity before us when we plant our orchard. Of course, in this world there are all kinds of opportunities for some men and none for others. For instance, I see a fertile field out here. If I know nothing of farming that is no opportunity for me. I would starve to death. If I am an ordinary farmer, practicing the same methods as my remote ancestors, possibly I can make a living from that field; but if I am a scientific farmer that field is a great opportunity for me and presents great possibilities. The other day in Harrisburg one of the legislators seemingly ridiculed this farmers' institute work, that there was too much theory in it. Gentlemen, I have never been afraid that the majority of our farmers will get too much theory into their practice. I think they should have more theory. To make them think and sit down and work out the problems and try a little bit of theory in their general farming operations. There are too many things on which we do not have the whys and wherefores. For instance, about this time of the year we fruit men are spraying for codling moth and curculio. What would it avail us if we knew nothing of the habits of life and the methods of control. It would avail us nothing. And this, gentlemen, is the reason why some farmers are able to make a success and other farmers make a failure. There is no doubt a great opportunity in this old State of Pennsylvania, for the right kind of men, for Pennsylvania is being stirred up along the lines of horticulture such as never before, and if there is any one reason why I am proud of being a Pennsylvanian it is because she is able to produce fruit of the highest quality and within the next decade she is going to increase that fame until distancing all competitors.

The CHAIRMAN: Is there any questions to put to Mr. Funk?

A Member: Mr. Chairman, he is a chip of the old block, all right.

A Member: In reference to the dwarf apple, are they a success to use as fillers?

MR. FUNK: I do not know much about dwarf apples. I think some are highly recommended in some parts of the State, especially in York county. We do not plant any Wageners as fillers.

Member: There are some parties grow them entirely?

MR. FUNK: Yes sir.

The Member: Is that profitable?

MR. FUNK: I don't know. I hear discussions pro and con and I would not like to say. I never had experience. Van Alstyne, from New York, seems to think it is not.

A Member: Where do you do this dwarfing?

MR. FUNK: I do not know. I am not familar with the dwarf apples. Mr. Tyson can tell you more about that.

A Member: I would like to know a little about the dwarf apple.

MR. TYSON: The dwarf apple is produced by fruit grafting on stock of a dwarf character which produces that dwarf characteristics of the other plant; and any variety, any standard variety of apple can be dwarfed by working it on this dwarf stock. As to the profitableness of it, I question it very much. It seems to me that giving a little more room to a standard tree has very much greater possibilities. I think it is entirely possible to have good results from using apples of a dwarfish nature, such as possibly the Wealthy and Wagner; but restricting the natural growth of the tree by working on dwarf stock I question.

MR. JOEL A. HERR: I would like to call attention to the fact that this room is a hard room to hear in and I would ask the speakers to speak a little louder and distinct because half the audience cannot hear what the speakers are saying.

The CHAIRMAN: Mr. Funk, I would like to ask you a question. You have knowledge of the character of the orchard inspection going on in the State of Pennsylvania at the present time?

MR. FUNK: No sir; I have not.

The CHAIRMAN: Then you cannot answer my question?

MR. FUNK: No sir; I have no knowledge of that inspection.

MR. DRAKE: I am contemplating putting out an apple orchard. The question comes up of fillers. We have a good many peach trees now. In talking with a nurseryman he advises to use as fillers dwarf pears. I should like to know whether Mr. Funk or any other fruit grower have had experience or can advise me along this line.

MR. FUNK: In regards to the question of pears, it is my personal opinion that in a few years there is going to be a market for pears, because wherever you go you find very few, only the Kieffers. I think there is going to be money in pears if you have a good market for them. There is a market for Kieffers in the coal regions and also in New York, but you ship Kieffer pears to Philadelphia and you cannot realize anything on them.

A Member: How do you regard them for canners?

MR. FUNK: All right for canners; best in the world.

A Member: Can you buy them in cans in grocery stores?

MR. FUNK: I don't know about that.

A Member: I have heard of Kieffer pears being labeled as Keiffer Belle.

A Member: How long can you prolong the life of a peach tree by dehorning?

MR. FUNK: Some men claim that they can prolong the life of the peach tree to a great extent by dehorning and I think it is very practical if you are not too badly troubled with yellows. That is one of the great troubles with us. When our peach trees get up into ten, twelve years of age why the orchard is broken up with yellows and it does not pay us any more to let these trees stand and dehorn and keep on cultivating. Last year in the spring we had a severe snow storm and it drifted in on one part of the orchard over the tops and they went down and broke to pieces, leaving one limb or so, yet nice trees can be made out of them a year hence. The yellows are most too bad for us to practice that and when up to ten or twelve years old we tear them out.

A Member: There was an old man in our section of the country had a peach orchard ten or eleven years old, badly broken down with the yellows and he practically never made much out of the first growth of the trees. About four years ago he went to work and dehorned these trees and he cut them short and last summer he had a fine crop of peaches, some of the good old kind that we raised before the disease struck us and these trees are thrifty and healthy and look like they would last for ten years yet. If this dehorning is a success you ought to do it.

MR. FUNK: How far apart did he have his peaches planted in the first place that he did not get a first class crop at the first growth.

A Member: 20 to 25 feet.

MR. FUNK: There was no reason then why he should not have gotten a crop of peaches on the first growth if on the second growth. I though possibly he made the mistake of planting them too close.

A Member: No, that was not it. He did not give them attention. The cultivation was poor and the soil the poorest I know of, not worth a dollar and clean of plant growth. He has an old horse and he told me he let it out all day and it would go up close to the trees and not touch one. He has had marked success. I think it is better to grow the apple orchard faster instead of using the fillers.

DR. FUNK: We like fillers but we are able to tear them out when the time comes. We have conscience enough to cut down these fillers when the time comes.

A Member: In having your fillers of peaches and fertilizing with different fertilizers does not work in that particular sense.

MR. FUNK: There is a great difference between the proper fertilizer for the peach and for the apple. However, in the first few years of growth of the orchard when we plant with peach fillers we make no difference. We usually fertilize nearly alike. We don't use much nitrogen, sometimes a little, 2 per cent of nitrogen; and from then on the apple tree should have more nitrogen while the peach tree should have more phosphoric acid and potash. In peaches our formula is possible 1-6-5, to 2 per cent. of nitrogen about 10 per cent. of phosphoric acid or even higher to 14 per cent. and 10 per cent. of potash; while on the other hand with the apple I would rather have about 4 per cent. nitrogen, 10 per cent. phosphoric acid and about 5 per cent. potash.

A Member: Do you recommend barnyard manure for peaches?

MR. FUNK: No indeed, there is too much nitrogen in it. If you put barnyard manure on peaches and cultivate constantly you will have the trouble they had in Lancaster county and different places this last year, owing to the fact that there was a late fall and the trees were in good growth and did not harden up and froze back and you get the same results from barnyard manure. There is the trouble with our barnyard manure. It is not practical on our soil.

A Member: This old man has a shed and keeps his horse up there and makes a little manure and he likes barnyard manure for his peach trees and where he spread it they made a better growth on that poor soil.

MR. FUNK: That makes a difference. If the barnyard manure was put on good soil it would make too much growth. If you have thin soil I do not believe barnyard manure will hurt the tree after it gets up in age.

A Member: What do you do with the peach borers?

MR. FUNK: In the spring of the year we go in the orchard real early and back up our trees six or eight inches so that when the moth of the peach borer lays her eggs on the trunk of the tree and these eggs hatch out and the larvae go down into the ground, they dont get into the roots if you have six or eight inches of ground around the trunk of the tree you will have the borers where you can easily get at them in the fall. Then in the fall we take away this ground and dig out the peach borers and in two weeks go over them again and wherever there is a peach borer you are able to distinguish it by the residue left there; after we have done over the second time we bank up again and let go to the next fall.

A Member: You just bank up with ordinary soil?

MR. FUNK: Just a little to keep the larvae from entering the root.

The CHAIRMAN: Now Ladies and Gentlemen, I have the pleasure of introducing to you Mr. W. W. Farnsworth, of Waterville, O., who will speak to you on "Horticulture; Past, Present and Future."

HORTICULTURE: PAST, PRESENT AND FUTURE.

By W. W. FARNSWORTH, *Waterville, O.*

This topic has a wide range because I did not know the character of the audience I was to address. In coming here from Ohio yesterday, speeding along past the farms and cities, my mind went back to the time 75 years ago when my mother left this country, traveling across the country to the Far West of Ohio in the old Conestoga wagon, and I thought of the great changes in transportation since that time and wondered if the agriculturists and horticulturists had kept pace with improvements in other lines, and I thought possibly just a few moments spent in looking over the advance in horticulture might be of value to us in forming a little better analysis and arriving at a better understanding of our conditions at the present time. That does not mean that I am going to give you the history of the apple from the Garden of Eden to date because most of us live in the present. But we realize that in the early days of horticulture it was a simple matter of planting and God did the rest and fruit throve luxuriously. All that was necessary was to plant and harvest, and the market was uncertain and unreliable; sometimes a little demand, but in the main it was well supplied with the products of the farm orchard. Then later there came a period when the insect and fungus enemies began to arrive and we had no means of combating them. Horticulture was shrouded with superstitions and foolish theories without any sense or foundation. Once in a while they hit it but oftener missed it. I remember about that time I was secretary of our State Horticultural Society, and one of the questions which I put on the program was this: "Will it pay to plant an apple orchard on land worth $100 an acre?" and leading horticulturists of our State discussed this question and decided it would not; that the apple crop was so uncertain and when we received a crop the price was poor; that the part of wisdom was to plant lands of no value for anything else and what was received would be clear gain. But at the present time we feel that the best way to receive a profitable return from land worth one or two hundred dollars an acre is to plant an apple orchard.

What has brought about this change? About the time I speak of scientists, agriculturists and orchardists began to study these problems. They began to realize the fallacy of laying down hard and fast rules: such as sow your turnips on the 25th of July, and other fallacies; and they began to understand that we must study the underlying principles and know more of the requirements of our trees and then to try to provide these requirements under the most available conditions, and the progress has been such in the last 15 to 20 years that horticulture has risen from an occupation of uncertainty and mystery and unsatisfaction and has now attained a state where it is considered one of the safest and most profitable of commercial ventures, and business men and men of all ranks and professions of the city are beginning to realize not only its pleasures but its profits. I think we had a splendid demonstration of that this morning and just as soon as we have such a young man as Mr. Funk in every township of Ohio and Pennsylvania then horticulture will make wonderful advance and will become one of the most profitable and interesting industries in our country.

We need more men who will study the needs of the trees. Dr. Roberts, of Cornell, was once asked by a dairyman how a certain ration or combination of foods would affect the dairy cow. His answer was: "Don't ask me; ask the cow." We want our trees. It is well enough to ask each other what food to give the orchard, but after all we must ask the trees themselves; we must study nature closer and watch the effect on the trees. The experiment station and agricultural society can make suggestions and can help wonderfully, and I do not think anybody can attain the highest measure of success, can do himself justice, unless he gets all the aid possible from them. Life is too short to try to dig these things out for himself, but he must take their suggestion and put them into practice. The experiment station can give us the verdict but we have to execute it ourselves. We must modify all their requisites to suit our individual cases.

I was much interested in the statement of Mr. Funk that while he would not advise putting manure on the young peach orchard it was all right later on when a particular case was cited. In handling the peach orchard we must have a good growth early and cover crop later in season. I am not afraid of excessive growth early in the season. I have a bearing Elberta orchard, bearing moderately in 1909, and we gave it a liberal application of manure from the steers sheds, reinforced with acid phosphate. We got a great crop in 1910. This year we are putting on the manure again not on the young trees but the mature trees, and have another heavy crop on the trees; so if we say in a general way, use manure on your peach orchard and you don't use judgment it would do you greater harm than good. It would be like the gentlemen who imagined he had many physical ailments and he read all the circulars of patent medicines and all medical reports and prescribed for himself, and a medical friend said: "I am afraid if you are not careful some of these times you will die of a misprint." Some of those who are accepting all reports with an occasional misprint in them can realize what that means, and if we are going to take these statements without analyzing them ourselves and questioning whether they apply to our own needs, some of the trees and orchards will die of a misprint.

We want to realize that there are certain requirements that all trees have in order to succeed. One of the first of these is moisture. Now to secure that moisture we must store up and utilize as much as possible the natural rainfall, for I take it that irrigation is not to be considered in this climate; in fact, I do not consider it necessary in orchard culture; but if the soil is not naturally well drained it should be underdrained thoroughly. This will not apply to all Pennsylvania conditions, but it does with us because my orchard ground is thoroughly underdrained with tile three feet deep. We not only remove the surplus water objectionable to the tree but build up an aerated soil and reservoir to save and take up the moisture that falls during the winter and spring and then by cultivation or mulching, for I use both methods, we preserve that moisture for the use of the fruit, for you realize that fruit is largely composed of moisture and we know that the more water we can get into the peaches and pears the larger the price we receive. There is another aid to storing moisture and that is filling the soil with humus. We cannot get the best results in fruit culture unless ye have a soil full of vegetable matter. This not only adds a food value to the soil by adding that which is positively plant food but it makes available the plant food already in the soil, the manural elements of the soil and also fits it for storing a largely increased amount of moisture for the needs of the tree and fruit during its development.

There are various ways of securing this humus in the soil. No one way is best fitted to all conditions and cases. Orchardists will follow different methods. Now possibly to give you the greatest information in the limited time I will occupy I might just briefly speak of my own methods in this connection. Sometimes it may seem egotistical, but after all we like to hear a man tell what he knows about rather than theorize on what may be done or should be done. The life history of my orchards may be divided into three classes or ages. First, the young orchard for several years after planting. I mean apples, pears, peaches, plums and cherries. We plant the young orchard and grow other vegetables, potatoes usually or small fruits in it, and in the small fruits we grow mostly strawberries and currants. I formerly grew raspberries and blackberries in the orchard but don't think they they are quite as well adapted, and for the last few years am not growing blackberries or raspberries for the reason that the marketing of them interferes with the harvest of our currants and cherries which we find more satisfactory and more profitable. In the peach orchard we grow nothing but potatoes. I have grown strawberries in the peach orchard once or twice. The first year after strawberries are planted it is a good crop for the peach although the strawberry wants to be cultivated late in the season and there is a little danger, in excessively rich ground in planting strawberries on the peach orchard, of forcing a late growth the first year. But if you can avoid this you can safely plant strawberries in the peach orchard, especially if you take the plants away from the trees the next spring and then throw a liberal amount of mulch up around the tree to preserve moisture. But it is not an ideal crop for the peach orchard. We prefer potatoes the first two years. After that we cultivate clean the forepart of the season and how much and how late we cultivate depends on whether they are making little or full growth. This, of course, you understand is to preserve the moisture and make available the plant food.

So much for the peach. With the apple, pear and the plum especially we prefer to plant currants. We don't want our whole acreage in currants; but on the richer ground we find them an ideal crop to grow in the orchard. In other words, in the orchard where we don't plant currants we grow potatoes and strawberries and alternating, keeping this up for five or six years until the trees begin to bear quite freely, not heavily, of course. Then we begin the second stage of the life of the orchard, and this consists of cultivation and clover crops, beginning as early in the spring as possible. This is where many make a mistake, especially those divided between orcharding and farming. We plant the corn and sow oats and then go in and plow the orchard; and that corn crop may yield between $20 and $40 per acre and to get that in the best condition you are neglecting a crop that may return you all the way from $400 to $1,000 an acre, as Mr. Tyson and Mr. Funk have stated. The orchard needs that moisture that is being lost every day the ground is not stirred, the orchard needs that and will return better pay than the oats field or corn field.

Work at the orchard first. There may be a little modification of this in some instances. For instance, you have sand vetch growing in the orchard,—and I consider that an ideal cover crop in many instances,—if the orchard is reasonably young and not needing a heavy supply of moisture, you will be justified in leaving that stand late, for the sand vetch is not quite the ideal from the fact that the ideal cover crop should make its growth in the fall, die down and be plowed under in the spring. We have not found that ideal cover crop yet, but sand vetch does not seem to rob the ground of moisture as rapidly in the spring as other crops. If we let it stand a week or ten days later than this and then plow under in our orchard the little moisture we lost is compensated by the vast increase in fertility. I have another orchard that I have rented, several miles from home where we can not apply barnyard manure. We have not tried to grow anything in it and this year we are using soy beans. I have had the ground plowed and will drill in soy beans in a few days. This orchard is planted 35 feet apart each way and the trees are young and we can grow a cover crop during the coming seson. For a cover crop to occupy the ground at this time of the year I think there is nothing equal to soy beans. We put them in with a grain drill, allowing every third hole to run and cultivate with the sulky cultivator. That means cultivation of the orchard through growing season and at the same time you are growing a great deal of fertility there that is valuable. I believe as a rule you can grow fertility in a young orchard cheaper than you can buy it in sacks; I believe as a general rule you can do this. This is the second stage of our orchard. Then in some of our orchards, especially the apple orchards, where we made a mistake early in life by planting too closely together, we have adopted the mulch method, letting a little grass grow and hauling in old straw and corn stalks and coarser manures, anything to make mulching material, and mulching those trees. If I had unlimited quantities of mulch I would prefer that method to cultivation, as it answers the same purpose and has the same advantage, but it requires a great amount of material, and I think those situated on level ground where we can cultivate will find cultivation better, although I have seen at the Ohio Experiment Station their plots mulched have made better growths than the cultivated plots; but on my own soil I have not got those results, so that whereever possible I practice clean cultivation. Perhaps that is enough time spent on the cultivation.

Now just a word or two in regard to spraying. I feel we are learning new things every year about spraying. I believe we have been taking these recommendations too generally without discriminating, I think, as to our own particular needs. We have not stopped to ask whether we neeeded a fungicide or insecticide and have not been thorough enough in application and prompt enough. I believe it will pay every orchardist to use every means in his power to have plenty of power and spraying material on hand. keep one or two extra outfits on hand, so that if anything happens we can go on with the work to advantage and at the right time and we must have outfits enough to use the winds when just right. It is an advantage to give over three spraying and four if possible. Last year I only gave two sprayings. Don't understand I am advising this. I would not advise it under many conditions, but in our region we are not troubled with the bitter rot and other fungii and when spraying through the dormant season we spray for San Jose scale and scab, and that with us is sufficient; and then as soon as the blossoms fall we give another spraying, drenching the trees from three or four sides with dilute lime-sulphur and arsenate of lead and then feel secure that our crop will be perfect. Last year I had some careful tests made. Prof. Green and his assistants conducted the experiments, and after being there a week he found less than one-half of one per cent. of wormy apples. This was after one spraying after the blossoms fell. That was not in old neglected orchard. I did not think it would be possible by the most diligent work to secure these results the first season in such orchards. This was an orchard sprayed for twenty years and in good condition to begin with.

There is another point that I think perhaps is not thoroughly understood by some in the cultivation of the plum. We have some perfect results in the cultivation of the plum in protecting them from the curculio by spraying three or four times. Our method is simple. We spray with the lime sulphur concentrated solution, 33″ Baume diluted one to forty for plum, cherry and pear; add 2 pounds of arsenate of lead to 50 gallons of the mixture. This was for the first spraying after the blossoms fell. We prefer to spray the plums from one side and then wait for three or four days and spray from the other side and then again repeat. We have sprayed last year I think five times, three times on the one side and two from the other. The second time over we omit the lime-sulphur and use milk of lime in its stead with the arsenate. There is cumulative effect of lime-sulphur when used once or twice successively and used with the same strength a half dozen times in succession there is danger of injury from the left-over accumulative effect and in order to avoid this the second spraying we omit the lime-sulphur. I spent half an hour yesterday looking through our plum orchard and did not find a single plum showing the curculio mark. This year we have only sprayed three times. We had a full set of plums and no signs of curculio and if a few should appear we have plenty of fruit left. About the time the plums color we repeat this process, using the same mixture and about the same number of applications. The great bugaboo in plum culture has been the curculio and rot. Last year we had practically no rot. I told my son to count carefully all the plums that showed it. He packed 83 bushels one day and reported he found three plums in the day's picking had any indications whatever. You know what that means.

Let me give you another lesson we learned last year, in regard to thinning. We make a practice of thinning all our fruit and last year after thinning the peaches we went into the plum orchard, thinning all the orchard excepting the south half of two rows, then cherry picking came on and we did not get back to the plums for five or six weeks when the rest of them were thinned. At picking time we found those that were thinned early were easily fifty to seventy-five per cent. larger than those thinned later, and when blooming time came this spring where we did not expect fruit we found that the entire orchard was full of bloom and set plenty of fruit except those two half rows that were thinned late. They had nothing while the other end, the same variety, thinned earlier, had plenty of bloom and set a heavy crop of fruit.

Probably I might just as well speak of thinning here as later. I think Mr. Tyson spoke of the advantage. I know the larger grower of fruit will say it is impractical but it is not, it is much better to do it early. The time to remove and pick off part of that fruit is from June to July. Some thin up to October. Suppose you have a tree with 10,000 apples on and it should not have over 5,000, which is the easier and better? to pick 5,000 of the small ones of early and then in the fall pick off 5,000 good first class apples that will bring good prices and please the customer; or to leave them all on and have them all of an inferior size and quality to pick off in the fall if they have not broken the tree or prematurely fallen. Thinning makes less work in the whole and is more profitable. I spoke of 10,000. I wonder if you ever counted the number of apples on a tree? Last year when the thinning test was being made they counted the apples taken from one Grimes Golden 23 years old. They removed at least 5,000 and still left too many on for a good big crop; another tree they removed 6,500 from.

Just a few words in regard to the marketing and picking and I will leave the rest of the time for questions and discussion, for I believe that is the most valuable part of the meeting. We can only undertake in these scattering remarks to hit the mountains, but when you ask the questions I know the information you are after and I may be able to give some. I was glad to listen to Mr. Tyson's remarks in regard to handling fruit. I believe more people fail in gathering and marketing them in growing and especially is this true with those whose education is largely as farmers. It does not require much skill to grow a crop of wheat or corn and haul it to the elevator. Another thing, there is not an awful margin between No. 2 and No. 3; and that is one of the reasons why skill and excellence and care pays a larger premium in growing fruit. To begin with, to harvest a crop properly, we must have the fruit well grown; it must be thinned and as early as possible after the June drop, for every day that the fruit remains on these trees it is sapping that much of the energy and vitality of the tree that should be preserved to perfect these specimens left.

We find it a decided advantage to have varieties and succession of fruit. One of these advantages is you can keep the uniform help throughout the season. The most of our fruit is sold to grocers and consumers; very little through commission men. We get up a trade and hold it, starting with strawberries and lasting the entire season. We have early apples, peaches, pears and plums, so that it is a continuous performance from the time the strawberry begins until next spring when the last storage apples are gone; and having trained help we get better work and more careful work, because the steady employment will improve them. The question was asked in regard to preventing the scars pinched with the ends of the fingers. There is nothing that helps as much as object lessons. I had some new pickers one year and we started on Grimes Golden which shows the bruises rapidly. I picked up half dozen apples which were picked with the ends of the fingers and I told the pickers to look at them the next day. The result was a little black spot. That meant a great deal more to them than any words I could express. I think it pays to make a point. We had two or three peach trees in the sour cherry orchard and not spraying the sour cherries for scale we neglected the peach trees and the result was we had a lot of curled leaves. I took occasion to call the attention of the new men to it and the old men too. It don't hurt any of us to be reminded of what we know, and there is no way in the world that you can impress the importance of things I think as by showing the results. I think one of the things the apple growers want to do is to grow apples of quality and the next thing is to get them direct to the consumer with as few go-betweens as possible. This won't apply to all. Those who are growing large quantities of apples in a commercial way, who don't do anything else and have not the transportation to reach the consumers direct will do better to sell in carload quantities. But there are a great many of us who could do better by storing our own fruit and going direct to the consumer, and that will appeal to the consumer and customer and will be likely to get more for you. That is the opening for the Eastern apple, and if Pennsylvania, Ohio and New York will live up to the opportunities in this direction and take pains and care to grow the best they can grow and put them on the market in distinctive packages and with a distinctive label so that the customer may know when he gets them and realizes that they come from Pennsylvania, Ohio or New York, we can drive out the Western apple from our market; and we must educate those who know quality by appearance only, because we can beat them in quality and very nearly equal them in appearance; and if we put in the orchards the skill and expense that the Western grower does, we have the market at our door which will take up firsts, seconds and everything. I have solved this problem by building a cold storage house in which the apples are stored as soon as gathered, all the winter apples being put in there without sorting, and, by the way if you thin the apples there will not be much sorting to do and if carefully handled very few bruised ones. I think it was Mr. Tyson who spoke of the value of color. The apple that should be red and is not red is of no value to me. We are 15 miles from Toledo so that we supply the leading grocers there on orders. They phone in their orders twice a week for 20 to 40 baskets and they are freshed packed and covered with netting; and especially in that case we find that an apple without color not only has no flavor but has no appearance. In many instances I leave the apples hang on the trees, not picking them too early. Possibly in some instances they keep better in common storage if picked early but not in cold storage. An apple should be allowed to hang on until it ripens and colors up, and if sprayed thoroughly you will not have so many rotten, and if free from worms you will not have many to drop.

In regard to the discussion on fillers that was brought out—this is a kind of scattering talk—we have found the Rome Beauty one of our best fillers. The Wagener is good but with us the Rome Beauty is a better apple and sells better, while the quality is not equal to Wagoner; and I have been using this method of using Rome Beauty and Jonathan. I had 25 to 30 dwarf apples I set out 18 years ago and they did not bear any more than the standard trees. We have now only 12 or 15 left, and judging from my experience I would not use the dwarf apple. I have no use for the peach as a filler, for the simple reason it would be difficult to spray the one without interfering with the other. I know some do it. My plan is this: I plant my permanent trees 40 feet apart each way and right in the center of the square I put another of the permanent varieties. That means just as many more of the permanent trees. Then I put in between the fillers until I have my trees 20 feet apart each way. That requires a little care in the selection of varieties and in management and pruning. It would not be wise to plant Baldwins or any of those slow growing varieties 20 feet apart because before they bore you would have to chop down part of them. I can take any young orchard and by the wrong kind of pruning and wrong time of pruning I can keep that orchard from bearing fruit for five years longer than its normal period. Cutting off too many of these lateral branches and pruning too vigorously will check bearing and promote wood growth. I would not go to the other extreme of not doing any pruning at all. If I do prune I take pains in shaping my young apple tree. We don't do much pruning for a few years. You are not going to get such an excessive growth as to require a great deal of pruning after you have got them bearing. The peach is a tree that requires continuous pruning and a good deal of it; but in the case of the apple, pear, plum and cherry we try to do just as little as possible. They say sour cherries don't need any pruning. You know sour cherries will throw out a multitude of fine branches that cross in the centre of the tree. These intercrossing limbs must be kept cut out.

I believe that most of us will find it advisable to grow as nearly as posible a succession of fruits covering the entire season, fruits of good quality. We have a wonderful advantage over our Western competitors in having the markets at our doors, and while they grow fruit that will not bear transportation we can let the fruit ripen on the tree, handle it with care, grade it carefully and meet them every time. If you have No. 2, mark them No. 2. Grade them carefully and put your mark on them. Every package of our fruit bears a pink slip with our name and device, a four leaf clover, and that stands back of it as a guarantee. We thought it did not amount to much until last fall. We ran out of slips and we sent out peaches without them and the next day we got notice from one of our dealers that they did not want us to send any more without the pink slips. He lost a sale because a lady thought he was trying to bunco her. We have pride in our name and reputation and if you put your name on it and build up a reputation it is not a question of getting the money for your goods. It is simply a question of getting enough good quality fruit to supply the demand.

A Member: I set out several hundred peach trees this spring and cut them down to three feet from the ground and some of them are starting nicely near the top, but a great many are starting six to eight inches from the ground and a great many little shoots around the tree. Is it advisable to rub these all off and get started from above or better start from below?

MR. FARNSWORTH: I would let the ones start from below; let about three branches start from below and when they get up three feet from the ground pinch the ends off and make each one of these branches form two more. A great many peach trees started will do that, I have noticed, and we probably shall let all the branches grow from the ground. It will make growth enough. Next spring we will select three of these opposite to each other and about two and a half feet from the ground and we will leave two or three side branches on each one of these.

A Member: In regard to the soy beans you sow in the orchard, do you intend to plow them under or take off for hay or turn the pigs in?

MR. FARNSWORTH: If that orchard was fenced and I had the pigs to turn in I would do it because it would not take much fertility out of the orchard. Most would remain there, and you would get the benefit of the pork. I shall just let it go down to the ground; probably sow vetch on it, sand vetch, as it is away from home. Last year I cut some off for hay and fed to the steers; but ordinarily we simply grow it as a fertilizer.

A Member: How much seed do you sow?

MR. FARNSWORTH: About three pecks or a little more per acre. You know in drilling it in that way it does not require so much. Sometimes we sow acid phosphate with it in the drill. Acid phosphate seems to give better results on our soil; but we use it mostly in connection with the stable manure and we spread it around through the pens and over the yards to reinforce the manure and supply that element that is lacking in the soil and manure.

A Member: The reason I asked if by leaving it on it will make a great deal of wood growth by leaving. I take mine off and feed to the stock.

MR. FARNSWORTH: I have never been frightened of getting too much wood growth. You get it in the early part of the season. We have an apple tree that stands near the tenant house where it gets an excess of hen manure and it makes a great growth and the largest amount of fruit in the block but the apples did not color exceedingly well. The tree grew and we got fruit but it never got a real good color. It had an excess of nitrogen. I am trying an experiment on it with phosphoric acid and ashes thinking possibly by balancing up the food I can counteract the effects of the nitrogen I understand with the nitrogen we will get a larger amount of foliage and that to a certain extent will retard the coloring of the fruit; but I never had any injury by excessive wood growth, although it is possible to get it too late in the season. I manage to get it early in the season and give it a chance to ripen up. That is the advantage of cultivation in the forepart of the season and no cultivation and cover crop later, stopping the cultivation, it takes up part of the moisture for the cover crop and checks the growth of the trees and ripens up the wood. The cover crop adds humus to the soil and increases the moisture holding capacity of the soil as well as fertility.

A Member: In starting an orchard, what method of pruning the roots do you practice?

MR. FARNSWORTH: Why, if we have three or four roots seven or eight inches long, we cut off the broken and bruised parts and we cut the fibrous roots off. In the case of the peach we leave a single stem; but the other trees we leave three branches, never more, six or eight inches long.

A Member: What is your object in trimming the fine roots off?

MR. FARNSWORTH: They are not much value at the start. They are the feeding roots of last year. I can plant better and get the earth closer. You will not get the earth so solid around the roots if they are left.

A Member: How do you break up the soil in the orchard where you have currants?

MR. FARNSWORTH: We have generally been using a one-horse plow but never liked it and this year I put in the one-horse cutaway harrow. You can work up the ground thoroughly and then afterwards with the one-horse spring tooth cultivator.

A Member: How far apart do you set them?

MR. FARNSWORTH: This one plantation we planted ten feet apart. I like to plant seven and one-half or eight feet. We have to have room to spray. If I was limited for space I might put them seven feet. The Wilder and several other varieties ought to have eight feet between the rows. It gives plenty of room for spraying and the pickers to get through. We use the cutaways largely in our orchard.

A Member: How much arsenate of lead and commercial lime-sulphur do you use in spraying?

MR. FARNSWORTH: We put ten pounds of arsenate of lead in a 250 gallon tank. A little less might answer. A pound to 25 gallons. That is enough if you have a good article.

In spraying for codling moth we put on more material, spraying material than for other purposes so as to cover the tree thoroughly and are particular to have a good pressure. We are using 150 pounds and we have gotten splendid results.

A Member: What length of new wood would you consider a normal growth for a young apple tree the first year?

MR. FARNSWORTH: That is a pretty hard question. It depends much on the soil, the variety and time of planting. Anywhere from one to two feet would be a good growth the first year. It depends so much on time, the condition of the trees, condition of the soil, rainfall, etc.

A Member: How long after the blossoms have fallen can you spray safely for codling moth?

MR. FARNSWORTH: I don't know just how close you can come to preventing it after two or three days after the calyx closes. You want to get over them as quickly as you can. Prof. Gossard, of Wooster, in one or two outside orchards where he was delayed a little did not finish for about ten days or more and got splendid results. I do not want to throw that out as an inducement. You are getting close to the precipice. I would try to do it before that.

A Member: If the rain prevented you?

MR. FARNSWORTH: I would spray as soon as I could. We are having a little trouble just now. We are having a hot wind from the southwest for the past ten days. We have only got sprayed one way. I am going to stick to it and give the other spraying if we cannot spray for two weeks. We cannot get a satisfactory spraying against the wind. By having a good force of outfits we can spray both sides with the wind usually.

A Member: What about keeping sheep in an orchard and letting them keep down the brush and weeds where it is on a steep hillside and not practical to cultivate?

MR. FARNSWORTH: I have seen some orchards, one of a friend of mine who keeps many sheep in there and they are well fed and he does have fine fruit. Mr. Woodward, over in Lockport, N. Y., advocate that idea. He does it in this way. He stocks them with good sheep and then feeds them heavily, so that he is carrying plant food into the orchard and adding fertility. There is this objection: You must have high headed trees and this is a disadvantage in the way of pruning and spraying and getting the fruit. If the whole orchard is high headed and on a side hill it is a good way, and feed grain to the sheep. The balance that you feed the sheep will be left on the orchard If the orchard is headed so high that it will not be hurt it is a good way to manage. That will not take the place of spraying but it will help. I would not put any in my orchard.

A Member: Would you advise sowing alfalfa to pasture your hogs?

MR. FARNSWORTH: That is an experiment I would like to see tried but want the other fellow to try it. I know a man that claims that alfalfa is a good crop for the orchard. I am not so sure about it. I am skeptical when it comes to that. Hogs are all right in the orchard sometimes but will bear close watching. I would rather keep them separate. It might do to let them in occasionally. Alfalfa might be all right. We must try it first and I have not tried it.

DEPUTY SECRETARY MARTIN: Before closing this session, we desire to make the announcement for this afternoon, calling your attention to the program. The session will be presided over by Mr. George F. Barnes, of York county. As you will notice, this session is devoted to general discussion for the development of questions relating to the institute work throughout the State. Now to the Institute Chairmen, the County Chairmen, the Institute Lecturers and to all others we say to you this is your session. I hope to give a very brief synopsis of the work completed during the past year. This meeting will be thrown open for the development of this great work throughout Pennsylvania. The session will convene at 1.30 o'clock this afternoon.

The CHAIRMAN: Is there any other announcements?

MR. J. ALDUS HERR: On Friday, after we adjourn, the local committee has made some arrangements to show the visiting delegates our town. There has been a trolley car engaged that will hold 50 to 60 people and we will meet in the square at the monument at ten o'clock. It will take probably an hour and a half to go the round. Part of the route will go by James Buchanan's home, Stevens Industrial School and other places of interest in the city. We will be glad to have the delegates with us.

DEPUTY SECRETARY MARTIN: Another thing that has been overlooked, that is the appointment of a Resolution Committee. Usually at our meeting there are some resolutions that it is important to take action upon. Year by year one and another of our number are called away from these scenes and, of course, we always express in form of resolution on these things. We will appoint on this committee Messrs. Dorsett, of Tioga; Lighty, of Adams; J. Aldus Herr, Lancaster; Schultz, of Montgomery, and Biddle, of Bedford. Persons having resolutions that they desire to have presented will go before that committee any time and place where they may appoint for their meeting.

MR. JOEL A. HERR: I have been informed that Mr. Dorsett has gone away.

MR. SCHULTZ: I am sorry that I too must go away.

DEPUTY SECRETARY MARTIN: We will appoint as substitute for Mr. Dorsett, Mr. Joel A. Herr, and as substitute for Mr. Schultz we will appoint Mr. Taylor, of Washington.

We will now adjourn until 1.30 o'clock this afternoon.

Wednesday Afternoon, May 24, 1911, 1.30 o'clock.

Mr. G. F. Barnes in the Chair.

The CHAIRMAN: The hour has arrived for the opening of one of the most important sessions of this Normal Institute, and inasmuch as the time for this session is always too short I trust that those speaking on the different subjects relative to the management of Farmers' Institutes will condense their thought to the subject and will talk along that line in as brief a manner as possible in order to give each and every County Chairman as well as each of the Lecturers an opportunity to offer any suggestions which may be helpful in bringing about more successful institutes in the future than we have had in the past. I appreciate the fact that Pennsylvania Farmers' Institutes are among the best held anywhere in the United States, yet there is always room for improvement and for that purpose this meeting is held. I trust that we may all get some assistance in this direction at this session. Hon. A. L. Martin, Director of Institutes will now open the discussion.

DEPUTY SECRETARY MARTIN: Mr. Chairman, Friends and Fellow Workers: You must not think when I hold up this manuscript that I am going to read it all to you. We have here in a condensed and tabulated form the attendance at all the institutes that were held last winter in Pennsylvania; not only the attendance, but the number of State Lecturers who attended these meetings, the number of local people who addressed these institutes, the number of sessions that were held, where they were held in the different counties and the attendance by session by two and one day institutes, and the attendance by counties, the final summing up of the attendance in the entire State; hence I have brought this tabulated manuscript with me in case questions might arise relative to the work in the different counties that we could not have this manuscript for reference in that event. I might say that last year's work with the institutes has marked what we might call the highwater mark. The attendance was greater than ever before. The interest manifested, so far as reports have come to me, was never so intense as last year. Indeed, farmers and other citizens, men in business vocations and in other callings have manifested an interest in the development of agriculture not heretofore known or heard of and the requests we receive at the office for additional institutes and movable schools are such as shows to me and to you the work is on the increase everywhere. You might be interested to know something of the attendance in some of the counties in Pennsylvania. The attendance ranges from 1,000 to 14,685. The county this year having the largest attendance is the county in which we are now holding this Normal Meeting, the County of Lancaster. No word of mine could in any manner do justice or credit to the standing of this great county amongst the farming communities of the world. It stands out as the one county showing an example of thrift and prosperity and agricultural advancement excelled by no county in the history of the world, and hence we are proud to hold our Annual Meeting amongst farmers of such great excellence and advancement. Lancaster county had 14,685 people in attendance; at all their sessions. Then the next county is York, with 11,715; then the County of Tioga, 7,180; Schuylkill, 4,785; of Montgomery, 5,560; Indiana, 4,485; Dauphin, 4,790; Chester, 5,265; and the County of Bradford, 4,225; and of Berks, 4,083. The counties that I have enumerated are those having the largest attendance. Now when I say the largest attendance I don't want to be understood as saying that they gave the largest attendance in proportion to their number of farms or population. You know that there are some counties in Pennsylvania with a population of but a very few thousand that have given an attendance practically equal to the number of farms; that is, proportionately equal to the others, and in some cases excelling, in proportion to the number of farms in that county, by considerable. Thus you see we are only enumerating this great attendance as phenomenal, but if we were to analyze this attendance we would possibly develop the fact that in some of those counties which have only two and three day sessions the attendance in proportion to the population would be greater than Lancaster county.

You are possibly interested in some of the subdivisions of the work, and hence we have some data here that ought to be of interest to you. These meetings have been divided into some four subdivisions. We have what is known as the Special Institute. These Special Institutes have grown up within the last two or three years, in which the farmers' organizations, the farmers' unions, farmers' clubs, local granges, in different parts of the State are exceedingly anxious to procure instructors along a certain line of farm operations. A correspondence is developed with the Department through which we send to these various localities one or two instructors, joining with the locality in the development of this work, and hence we call these meetings Special Institutes, joining with the local people both in the development of their community and their institutes in this direction. Now there were in attendance at these Special Institutes last year 10,376. At the Regular Institutes, the institutes that have been scheduled regularly in our bulletin, the attendance was 162,809. Then we have still another division of this work that is rapidly developing in Pennsylvania, and of no mean importance, I refer to Harvest Home Picnics. You know one of the grandest things and probably one of the best organizations that we have in Pennsylvania for developing the social side of farm life are these Harvest Home Picnics. There the farmer and his wife, sons and daughters, the young and the old people of the territory, coming from miles and miles, assemble together out in some beautiful grove, and in lieu of spending that time in amusements that would be worthless and unprofitable they have invited the Department to join with them and send lecturers in order to devote at least two hours of the day to the development of the great work upon their farms, and we join with them in that work and so far as means and speakers are available we have afforded the same, and at these Harvest Home meetings last year our speakers addressed over 20,000 people. There is also another division of the Farmers' Institute work that I will refer to and that is what is known as our Movable Institute Schools. These Movable Schools were held last year in the following counties: Potter, Warren, York, Lackawanna, Columbia, Venango, Erie, Crawford, Westmoreland, Chester and Lehigh. I stop for a moment for a word in reference to these Movable Schools. No one of these schools was held at the last season occupying less time than four days. In the County of Columbia, where there were two of these schools held, there were eight days of Movable Institute Schools. These meetings differ from the ordinary Farmers' Institutes in that they take time to deliberate and develop a certain line of subjects. Thus far we have taken up for the past two years three distinct branches of operations carried on by the farmers of Pennsylvania, namely, and possibly of first importance, the dairy interest. You know the importance of this is a vast interest in Pennsylvania, and do you know, my fellow farmers, to increase that nearly a million of dairy cows in Pennsylvania it would possibly be a financial advantage to the owners of the same if one-third of these cows were to-day turned off to the butcher and the balance stabled, fed and cared for as the most approved methods of the day in which we live would teach. In these schools there is demonstration means of instruction. The Babcock test in learning of the butter fat contents, for instance; and in most of the places certain members of the class take hold of this work and learn quite readily how to handle that little implement that tells so much as to the profit or loss the dairyman is receiving from each of his cows if he will only follow its direction. Indeed, in many of these cases not only is the Babcock test used but the churn was actually brought into these meetings and the butter churned and they figured out the contents as to butter making in the lessons given. You listened yesterday to the excellent instruction given by one of our lady butter makers in Pennsylvania, developed along exactly the same line; and hence the importance of this cannot be made too emphatic. The profit to be attained from the dairy interests of the State to-day, my fellow workers, depends upon the manner in which each and every cow is handled and our efforts is to develop greater profit from them.

Now again the other two lines taken up in this school work are poultry and horticulture. Horticulture requires a line of cultivation to develop the growth of the tree and fruit from the soil of Pennsylvania and by reason of its peculiar conditions is indeed tending to develop probably the highest type of manhood, and hence we employ the best experts that we can procure to develop lessons in the various and most important lines in selection of the trees the selection of the plot for the orchard, the planting, cultivation, harvesting of the fruits and the marketing of the same.

And then again the last of the three lessons developed at these movable schools is that of poultry. We are just beginning to realize, my friends, the possibilities, the reasonable business possibilities and profits that can be attained in poultry lines. Indeed, the best figures that I can procure from Pennsylvania for last year are that from the sale of eggs alone in the State of Pennsylvania over $20,000,000 were procured. That says nothing about the value of the poultry, the value of the poultry buildings and the money invested in all these things, I am guaranteed in saying that there has not been developed a greater profit for the money invested in poultry in either the cow or the orchard. So we are developing along in these movable schools, teaching the most approved methods in the modified class form. They seem to be rapidly taking fast hold on the farmers of Pennsylvania. I have many requests for movable schools in several of the counties where they have not yet been held and most of the counties that has had schools within the last two years are to-day asking for same the coming season.

I should say here, lest I forget, that counties desiring the movable school (this is for the County Chairmen) when they make their report requesting and naming the places where the regular institute is to be held, should in that same circular, make the request for a school at the same time, and naming the place, I can assure you in just so far as the means at our disposal are available the counties asking for these schools will get them, providing the conditions under which they are attained are observed. One of the conditions is that we would not send a movable school anywhere in Pennsylvania unless twenty men or women sign a paper agreeing to attend all the sessions of that school. Now I believe that is right. We are not searching for some place where 5,000 or 6,000 people will attend. That is very encouraging indeed. In fact there are many of these schools where the attendance has been so great that we had to cast aside the question of class observation entirely and develop in more general manner the work. But a class of 20 in any given locality in Pennsylvania, young men or old men and women, who will come there with a full determination to arrive at a proper conclusion on the matters of the development of the interest in which they are engaged, are a sufficient number to guarantee a school, and we believe if we can get 20 men and women in a locality so earnest that they will come for three or four days in the week to take in and absorb the lessons developed there, the object lessons standing out in that community practically are to have better agriculture.

Now, my friends, I believe the program said that I would open this discussion. I think I have occupied my full time.

DR. CONARD: Do you have the attendance at the schools?

DEPUTY SECRETARY MARTIN: I forgot that. May I read it now. At these movable schools last year there was an attendance of 16,198.

Now let us sum up a little and see just what our attendance was. Total attendance, Special Institutes, Movable Schools, Regular Institutes, Harvest Home Meetings, 209, 383 people attending last year. The days of Regular Institutes scheduled in our Bulletin were 395 days; the days of Special Institutes, 24; days of Movable Schools, 58. We had $18,000 to expend on lecturers and hall rent at Regular and Special Institutes, of which we held 477 days. You know it costs something for these things. We have looked over the records of many of the states, and I challenge any state to show us a record that will excel ours, when all things are considered, for economy of work. These institutes include hall rent, everything connected with the work in the different localities, including the expenses and per diem pay of all instructors, and everything is $35.00 per day all considered. Many of the states are not higher than $50.00 and when we come to consider the character of the instructors and the character of the instruction, have reason to feel proud of the record of 1910-11.

In addition to this we hold annually our Normal Institute, the same meeting as we have it here. Meetings of this character cost us a little less than $3,000 all told. There are other expenses connected with this work, such as local postage and work of that kind, about $500. So that for the $22,500 that we have had to expend this last year we have accomplished such splendid results.

Now, my friends, we have devoted this afternoon session to the development of the great work. Here before me are the County Chairmen of Institutes and I want to say a word about that, gentlemen. I can think of no number of men anywhere that for the past twelve years have accomplished more disinterested, generous work than those men, without pay. An impression sometimes goes abroad over Pennsylvania that these fellows that have charge of institutes in the counties somehow or other get a pull. I want to say to you men now, you were invited to Harrisburg two or three days ago and the strength of your argument before that Appropriation Committee was such that I could say to them that here is a body of men that for the past 12 years have devoted about a month of their lives each year to the advancement of agricultural interests without a cent of pay. That closed the mouths of all parties for it is the truth, and the plain unvarnished truth, and they listened to you and they heard your arguments.

I want to say something more. The strength of these Farmers' Institutes in Pennsylvania is just disinterested work of such broad-minded men, who have been willing to do it because of the interest they have had in it for the last 26 years. I hope the time will come, and it will come and you men will show forth your strength in Pennsylvania to get what is rightly coming to you, that you should be worthy of your hire in this matter.

And now just a word to these other gentlemen and ladies. One of the things that we hope to develop in the future to a greater extent than has already been developed is that of women's work at these institutes. I am proud to say that we have in Pennsylvania in this institute work a corps of lady workers efficient and faithful to all the trusts wherein they have been trusted. They have gone forth over Pennsylvania through storm, cold, sunshine and cloud, teaching and meeting with the people, with the women and with the ladies, developing the questions of household economics, sanitation, education and teaching the development of home life; of all which I am very proud, and hope the day will soon come when we can go to the law making power,—and demand something practical, equal that given to the regular farmers institutes, for the development of women's work on the farm and in the home. It is coming. Now the men workers, we have a corps of over 70 instructors in Pennsylvania. The State College and Experiment Station has, so far as the duties of their strenuous work would permit, sent out their very best instructors to join with us in this great work, and I express here and now my hearty thanks to that great institution that is doing so much for agriculture in Pennsylvania and for the work they are accomplishing with us in this State. And the other men who are engaged outside of them are men almost universally who have by actual practice upon their farms and by their research connected with that developed full success in certain lines of agriculture; men of mature judgment and deliberation, sent forth in Pennsylvania to develop with the farmers of this State the highest order and conditions of agriculture. If there is any one thing I have reason to be more proud of than another it is that the Pennsylvania Farmers' Institutes have an organization of men in every county who are actually engaged in farming with their sleeves rolled up, and that we have a corps of instructors of ripe experience and actual practice upon the farms of Pennsylvania, and men of deep scientific research in agriculture, chemistry and botany as applied to agriculture. Thus we hope and expect that as the years pass on greater development, more thorough instruction in all of its lines will be developed.

Now, my friends, I shall not talk any more. It is your time to talk, to develop any questions that may come before you. I thank you for your attention.

The CHAIRMAN: Mr. Martin has given you a good line on the workk of the Institute Division and what has been done. Now you have an opportunity for the discussion of these different subjects and bringing matters before this meeting, and I will ask the speakers when they get up to speak to say, I am Mr. Edwards, of Adams county, or whoever they are and wherever from, and in that way we will get a correct record of the speakers and their thoughts. We are now ready to hear from you.

MR. STOUT: I don't want to force myself upon the audience as the first speaker or one who has superior knowledge, but while I sat here this forenoon I thought out a few lines that I noted down on this paper and now whether I will be able to read them or not remains to be seen. But listening to these discussions, some things have suggested themselves that I noted down. While it seems like thrashing over old straw it is likely there is some grain left in the chaff.

Continuing of the same opinion that I entertained and expressed at previous meetings, it may be profitable to repeat that the theory that the farmers in general have been neglecting the elementary in agriculture is not well founded. There is too much catering to the class of agriculturists who have great estates and incomes to devote to ornamentation and display. To present glowing pictures of mansions, lawns, poultry plants, model farm buildings, costing hundreds of thousands, is neither edifying or instructive to the average farmer who must depend upon his own efforts with no other resources than that taken out of the soil by his hands and his family's. The beautiful pictures presented by Dr. Hunt of the Alpine scenes, the towering mountains and glaciers presented to our view, we might desire to mount the high pinnacles of those glaciers, but we cannot. They are like the glowing pictures and discussions of some of our institute lecturers whose practical experiences consists of a view from a distance. Our schools are classified so as to reach all ages and conditions and it may be advisable to obtain two kinds of instructors; one group to instruct agriculturists and another to visit rural districts, cross road villages and isolated sections where primitive conditions prevail. In order to overcome some of the inconveniences encountered in this work it may be advisable for the Department to furnish conveyances on the order of the old Conestoga wagons or prairie schooners, supplied with some beds, blankets and robes and such conveniences as may suggest themselves while on the itinerary going from one place to another, and thus avoid the theoretical work of farmers' institutes. There has been complaint about institute speakers compounding the situation where large audiences had assembled at night to hear the discussions, and because the accommodations were limited and not equal to those furnished in the cities at $3.00 a day houses the lecturers went away without carrying out the program. These are a few of the views I entertain and if the Department can use any of these suggestions to improve the agricultural instruction of rural communities they are welcome to them.

MR. KAHLER: Mr. Chairman, our worthy Director has given us a lot of statistics showing the development and improvement in institute work. It is easy to make assertions. Now I think it is our business to give our ideas whether the institute is improving or retrograding. I have had the honor and misfortune of being an institute manager for twelve to fifteen years, and I am not saying this to the detriment of the men who were doing it before that. The point I want to make is, are we going uphill or downhill. I think it would be a good thing for all of us men to show that up. There is an Act of Assembly that says we shall publish when we shall have a meeting in our respective counties to receive applications for holding institutes. I supposed when I was first elected that I would meet a lot of fellows there and I met myself there a great many times and nobody else; nobody there at all. Now in the last two or three years if I don't go to the Court House at all to hear the applications I would have about three times as many as I could accept, by letter; and for the last two or three years in our county they don't only wait for that but they send a delegation to press, "give us an institute now." I can see it in what little time I have devoted in other counties, comparing it with twelve years ago when you would see a lot of fellows, four or five retired farmers probably come to the meeting, flat headed fellows that had left the farm. The men that we wanted to reach were not there, as a rule. At night we would have a full house, have to get a big house to accommodate them. Most of them came there—it is a place to go to see your best girl and all that sort of thing—but if it was not funny it would not amount to anything. Half the people have no idea in the first place of the institute work, what it was like or its purpose. I often think about it. I was sent to a certain portion of this State to an institute at one time and, to use the farmer's phrase, I was off in my feed. I played my part of it and went back to the hotel. It was a fairly good community, too. I sat down there and after awhile a gentlemen in the office, a commercial traveler, said to another gentlemen of the same kind who had just come in: "Well, James, where have you been?" "Oh, I was down here to a meeting. I have been traveling over this country and every once in a while I see a great deal about the farmers' meeting, a great outpouring of farmers. I had no idea what a farmers' institute would be, so I had a little leisure and I thought I would drop in and see what was doing at the farmers' meeting." "Well, what is it like?" "Very poor meeting," he says. "I got in there," he says, "and there was a big six foot huckster talking to a lot of people about feeding calves. Don't that beat you?" he said. I think some of our men have as poor an idea of what the purpose of our institute is as he had. But I don't want to take up your time, but I want to say that a great deal is in our hands to advertise. We have a blue print of what is to do and it depends a good deal upon the men to work that out. It is not doing what some of us would like to see it do. I had a conversation once with a friend of mine, a minister. He says, "I have been paying a great deal of attention to farmers' institute work. Is it doing any good?" "Well, I hope it is; probably not as much as we would like but we are not discouraged in the matter." He said, "I cannot see that it has accomplished anything." I said, "I would like to ask you a question." I said, "You are a minister of the gospel. Do you convert all the people you talk to?" "No." "Do you get discouraged and give up the business then? Don't you put on more stress every evening to impress your people to do what they already know than to give them any other information?" If you can make an impression in any community along your line of work on two or three men who have a good influence it will spread and you will soon see a widespread interest and I hope it will go on.

MR. SHUEY: I have a point that I would ask the Department to look after for the coming year; that is the clover question. Now we all know that we are lacking in growing clover as we used to twenty years ago and I have asked some of the lecturers that have been to my county on that very point and they would not give me the answer I wanted. They claimed that clover froze out. But it don't. There is something the matter with the clover, something working with the roots and it is dying off in the fields. I would like if the Department would get someone at work to examine that and in the next winter's lectures to have some competent persons to explain that and whether it could be prevented or not. That is one of our important points that we need in Pennsylvania, to keep clover more than one year.

And as the advancement that is made in the institutes in the counties, I must say for our small county that since these farmers' institutes are started—I guess I was one of the first that attended institute in our county. I know we held institute with six persons present when we started in first. Now it is sometimes difficult to get a hall large enough, especially in the evening, to hold the people all. And there is a great advancement made in every part of the agricultural lins in Lebanon county and especially in the fruit lines. We have some few persons that took hold of it that I don't think can be beat in the State of Pennsylvania. They bring the best quality of fruit and make it their business to study up and have the scientific fruit put in the market.

MR. STOUT: I want to answer the question that he brings up in regard to this clover. We had that discussion up at our institute last winter. There is a little insect called the clover root borer. I gathered some and exhibited them up in Blair county and I found them at home earlier in the season. About this time they have escaped and are laying their fresh brood on the young clover now growing and they practically destroy the clover crop that has stood for one year, and it is a question whether it is a benefit to have it destroyed, because I think it is better to have it plowed down for the coming year.

MR. J. ALDUS HERR: I have a few suggestions for our county. While our institutes have grown and are growing rapidly, yet the needs of our county I think are different from those of most of the counties in the State. What we would like to have would be persons who come here as speakers to be practical men, men who are practical cattle feeders. That is one of the main objects. We as a county feed cattle, what we call stockers, ready for the block. We want practical tobacco men. We have some but we need more. And we want more good men who are practical corn growers. These are essentials which right in our county confront all of us as farmers, and unless the men or speakers can appear before the audience and give their practical experiences and results I am afraid their labors will be futile here, with all due despect to the men whom you have sent here. We have made advances and if you go out over our fields you will find we are trying to improve as fast as we can, but we want practical men.

Another thing that is growing here within the last four years when we had our first exhibits at our institutes. Last winter we had over 1,250 exhibits. At one of the meetings we had to hire an adjoining hall to put the poultry exhibits in. We had a great exhibition. Now, if you can, would it not be possible to send us speakers that are versed in these different lines, who can score the different exhibits according to their merits and, if you please, have the person who grew them or exhibited them explain to the audience how they were procured. We can get the people, and there is not any doubt with a little push and with my assistance and Mr. Hibshman's we can make the institutes of Lancaster county a miniature winter fair, with the speakers coming here capable of awarding the merits of the different exhibits that we bring here. I don't doubt it in the least that we can get the different halls we have for our audiences two-thirds filled with exhibits. There is nothing so instructive or that inspires a person so much as to see the living object right before him. (Applause).

MR. PEACHEY: Mr. Chairman, what I am going to say I think will be more directly in favor of the farmers' institute lecturers' business than what it will be with reference to the work that is to be done at the institutes. I don't want my portico to get bigger than my house. For that reason I want to tell you that the thing I am interested in is getting rid of that Saturday evening institute session, and I know that some of them will shake their heads. It don't make any difference. I have seen them shake their heads before, but I know this and I am going to talk it from the standpoint of the institute lecturer that has been on the road all winter and not several weeks during the winter, and I am going to tell you that it grows mighty monotonous to work six days in the week and do your work and take it as it comes, which sometimes is pretty rough and was even last winter in one or two districts of a certain section of the State where you were required then to sleep in a place where you should not sleep and on Sunday morning take the train and travel thirty or thirty-five miles and stop at another hotel and then in the afternoon, towards evening start again and get to a place a little late at night and next morning get up for the 6.30 trolley and travel along to a station and then ride eight miles out in the cold to get to the institute on Monday morning. I am going to say right here that it is an imposition upon the members of the institute force and you may as well use plain terms because I want to be understood. I tell you that reminds me of a young man and lady that were going together and she had been somewhat tanned and sunburned and she said the hide on her hands and face were not just what she would like. The young man said she should not say hide; she should say skin. He said that is more proper. Then they went to church. The hymn was announced, "Hide me, Oh, My Saviour, Hide me;" and the young lady began to sing "Skin me, Oh my Saviour skin me." And so I want to say just this that when you are subjected to such things as that it comes near to "skin me, oh my Saviour skin me," working in the institute work that way and I would rather "hide me, oh my Saviour hide me," in a hotel over Sunday than do that kind of work. Now then you understand my position. Some of them come up and tell me, "we have got to have that Saturday evening session in order to make up our numbers." Why these numbers on Saturday evening might be all farm people or they might be all people that came to be entertained, and I know that I have tried to entertain them. And so I am interested in that from the fact that it saps the vitality out of the farmers' institute lecturer to work six days in the week and then travel on the seventh, and I want to know why we cannot use all the commandments just as well as a few of them. I believe that six days belongs to us as farmers institute lecturers, but I don't believe that we ought to work the seventh, and last night Dr. Bailey in his talk here spoke about the religion of the men on the farm, and I think we ought to take care of that on Sunday; and I am going to say right here as I said before, that it is not doing justice to the farmers' institute lecturer to require him to travel then. If you are going to have that Saturday evening session have it at the place where the institute lecturers can get in a hotel on Saturday night and have what he ought to have, and that is good accommodations over Sunday; and I am going to tell you this, that I have a lot of sympathy for that farmers' institute lecturer that is running away from these meetings on Saturday night in order to get to a good hotel on Sunday, from the fact that I believe that it belongs to him. Sometimes, I am going to say this; that as I look at the county, we commence at the wrong end, and I have traveled as much as eighteen to twenty miles after Saturday night's session to get to a place on Sunday, and I know others have done it. Now I don't know the sentiment of the institute lecturers but I know the sentiment of some of them. I don't know the sentiment of the farmers' institute managers with reference to this, but I know that of some of them, and I know that some of them have been very careful along this line and have endeavored also to arrange these affairs so that following a Saturday night meeting we were at a place where we could stop. Another story: You know a man was sick and he was very sick and just suddenly he became a little bit better. He did not know where he was. He woke up and said to his wife: "Oh, I feel so good. Am I in heaven?" "Oh no; I am with you yet; I am still with you;" she said. Well now, if we cannot get to that heaven of a good hotel on Saturday night to remain on Sunday, why please don't have the other end just as bad as it has been made for us sometimes.

Another thing I want to say: Last winter some of my mail went wrong. The folks at home did not know where I was and I know some of them cared. I knew where they were and I could write to them. We have that rural mail all over the country and it is a good thing all right. But if they don't know where to write to because sometimes the places of holding farmers' institutes have been changed to what the bulletin says and these things want to be right. I tell you it is a hard life to be hauled over the country under such conditions and I don't want to do work under such conditions and more than that, I am not going to very long; and so far as that Saturday night is concerned I am going to tell you here, county chairmen, I want you to do your best and if you have done your best I am going to do all I can possible for the institute work and there is no man here dare say I ever shirked my duty along the line of institute work or ran away from institute work when I was needed, and I am working for the best interest of that farmers' institute work; but if you are going to hold me out late on Saturday night, away from civilization and good hotels, you are going to be badly disappointed about four or five o'clock if there is a livery team anywhere near to get me out, because I am going to get those hotel accommodations and look after the business because Sunday is mine. It belongs to me and if you want to hold me and have me to work on Sunday I want you to pay me, and when you pay me I want double pay just as they do in many other instances where they require a man to work on Sunday. I hope I have made myself understood. (Applause).

MR. BOND: I just want to say that I have never been affected with fear of accommodations or sickness. If I was I would carry my medicine chest along or quit the business.

MR. WOODWARD: I have a very warm and sincere sympathy with the criticism that Mr. Peachey has made. I believe he is absolutely right. It has been a long time since I have been on the institute roster. I concluded that the audiences of Pennsylvania had enough of me and I dropped out. Since then I have not given it attention except in my own county and I appreciate very much what he said. I had the same experience when I was in the work and I appreciate it so much that in my annual conventions I take pains to avoid the conditions that he objects to in my own county. There are two methods by which it can be avoided. I have practiced them both at some places and at other times separately. The speakers need relief. It is a hard burden upon their physical constitution, six days and six nights in the work and they do work six nights, and the average institute workers, the better ones of them at least, make an average of fourteen or fifteen speeches a week. They are worn and weary and they need comfortable places where they can get a bath and hot and cold water and a warm room to sleep and retire, a warm room to write home and bring up reports. I do not critcize the Department for making the program out, but sometimes I think it would have been better if it could have been placed otherwise, but I am not acquainted with the conditions that the Department has to contend with. I may name the places four our own county and the Department takes up sixty-seven counties divided into sections and in establishing the itinerary for each section has to make an economic use of the funds as can be and I have no criticisms of that. But when I find that the speakers are to be in my county in places that are out of the way and where inconvenient or impractical for them to spend the Sabbath, where there are no good hotel accommodations—you may say yes but there are farmers will take them in and treat them to the best they have and as one of family, but he is not at home, not at liberty. He wants to go to the best hotel where he can write and rest and be comfortable. I know from a long experience. I provide for it by arranging to have three sessions on Friday and two on Saturday, eliminating the Saturday night meeting entirely in order to give them a chance to get away if I can or if necessary, I arrange that the State speakers be relieved from the Saturday night meeting and that the local speakers take up the work. One of them may be compelled to remain, but I take every means in my power to relieve them of what I know from personal experience of long years absolutely unfits them to do justice to institute work. It is hard work and no man can be expected to work six days and travel the seventh and be fit to go in for another week. And I say, without reference to the Department, that it lies in the hands of the county institute managers to relieve them to a large degree. I have not succeeded in doing away with the Saturday night session entirely in my county but I have succeeded in relieving them in that way in my county so that there is no complaints at all.

DEPUTY SECRETARY MARTIN: Just for a moment. I have learned that a gentleman very largely interested in good roads is present and can only be here for a few moment, Dr. McCaskey. The audience will listen to him for the few moments in reference to some things he has to say on this subject. You know we just passed a resolution this forenoon and unanimously referred it to the Legislature regarding good roads; and Dr. McCaskey can only be present for a few moments and we will suspend this discussion for that length of time in order that we may be favored with the remarks of Dr. McCaskey.

DR. McCASKEY: Mr. Chairman and Gentlemen of this Institute: This road question seems to me to be almost as important as the various ways we try to figure out raising cattle and avoiding disease in our crops, because if you don't have a good way to get your stuff to where you can sell it, why the expense of transporting our products is going to eat up a good bit of the extra profit you make by knowing how to grow and improve our stock. When I was asked to come here to-day I felt that I did not have any particular message to give, because you men know as well as I what we are up against on this road proposition. The thing is, how are we going to better it? That is the point we have to decide. Now there are several ways and the first and most important way is for each one of us in our own sphere to ask ourselves what we can do where we live, in our own circle, our own Senate. That is what I did. I am a country physician. I am not a road maker by scientific study. I simply am a practical road supervisor, because I asked myself that question: "What can I do in my own county, on my roads in my township, under the antagonism of my section? And here is how I got into it. There is a road called the Witmer Road one and one-half miles long, made of earth, just ordinary glue when the frost is coming out of the ground. My practice called me over that road five or six times a day. I drove it both by horses and auto. All efforts to get that road improved were of no avail. The road was like this: Hollow in the middle, high on the sides, full of deep sink holes. Sometimes you would sink half ways down to the axle. There were rough rocks sticking in the road and no efforts made to drain it. After every storm the water lay there for a week or ten days. I asked my supervisors nicely and as politely as I could to fix it. I said: "Gentlemen, I am up against this proposition. I want you to do something. Won't you please?" Well all I got: "We will do something later on; we have no money now." All right. I waited and waited and got back at them again. Nothing doing. So I got tired. I said, "Well, will you give me permission to repair this road, if you cannot?" I got the permission of two of the supervisors out of the three composing the board of supervisors. Well, I got a drag from the Lancaster Automobile Club, by the way, they furnished drags for nothing to anybody that would use them. I got a drag and started to drag this road to improve it. I did not know much about the principles of dragging and the first time that I dragged it, it was soft and that night it froze and made it a little rough for a day or two, but after the frost gradually came out I kept at it and dragged that road for several months and finally got it in such shape it was passable and respectable and it was a good road. I paid the bill myself. It did not amount to more than a few dollars. The supervisors then had a roadmaster and he did not like this. It was in his territory and he felt the reflection. It struck him that nobody should take some of his responsible from him and make improvement. If that man would only have been too glad not to bother about it. He didn't, so I did. They waited on me and said: "Doctor, you got to cut this out. You are damaging the road." Well, they could not show where I had damaged the road and, as I had the official consent of two members of the Board of Supervisors, I said: "Gentlemen, this road has got to be fixed and I got your consent and I am going to go ahead and fix it. It is up to me." I put it up to them and went ahead and dragged the road and got in it good shape and by the middle of May, just about this time, the Supervisors came to Lancaster and they swore out a warrant. They had an injunction served on me for injuring the road and they had that injunction served by the local constable and stopped me from my right which I used and which was improving their own township property. Well, of course, after the injunction I cut it out but the road was fixed, at least passable. But I wanted to know why these men had secured this injunction, just like any of you men, if they would come to your door and say you can't do it. You want them to show you. So I brought these supervisors right into this court room. The witness box is right here, and I made them tell the court why the injunction should not be dissolved. They had their witnesses and I had mine. I had the farmers that lived along the road for thirty years, and we had pictures of the road before anything was done to it and after I had used the drag on it. We showed these photographs to the court. We had men testify that knew the road before and after; took the testimony down by means of the court stenographer and the court reserved decision for a period of a month or two and then they made a decree to the effect that the wrong legal procedure had been taken and so of course the thing fell at once. But I used what the court stenographer had written down and published it, what these men said. I printed that and distributed it all over the township so that the farmers could ascertain the truth, just what was said by the road officials and the farmers who used the road and by myself who fixed the road, and the outcome, gentlemen, was very clear. Just like it would be in your own county. Where everybody knows the truth and the facts there is a general verdict. I ran for supervisor and I was elected and that is how I happen to be in the road business. This is what confronts all of us whether road officials or not. It is what each one of us can do in our own way. If you have a bad hole in front of your house or gate and cannot get it fixed why go out and fix it yourself. See your supervisors first, consult with them, see if they won't help you, see if they won't permit you to help them out and, rather than wait, after you have gotten power, go out and fix it yourself. There are lots and lots of ways to help in this road proposition. The ladies that go to church with their husbands, the children that go to school, the farmers that have to haul their lumber and oats and wheat have to use these roads. When you strike a bad place don't only say it ought to be fixed. Take out a piece of paper and pencil and write down just where that bad hole is and submit it to the road officials and tell them that this thing has been under your observation and that you would like it fixed and see what they are going to do about it. If they say they will do it when they can, that is not the thing. You want to find out what day the repairs will be made and make it your business to be there on that day and if nobody shows us, find out why they don't show up. This may be a rather strenuous policy, but it is the only way I find you get your road improvements. And gentlemen just remember this, that this road proposition depends on us a great deal more than it depends on the Legislature. For example: Mr. Jones, of Susquehanna county, introduced the Jones dirt road bill. He asked three million dollars appropriation for the use of each of our townships so that we could get fifty cents on the dollar for every township that had a cash tax. What happens? Why the Jones bill got knocked in the head and it is almost down and out. And it came out of conference last night there was five hundred thousand dollars to be awarded to the Jones bill for two years, two hundred and fifty thousand dollars a year for this great State with 4,500 townships. Why, look at it.

I am sure, members of this Institute, that this is a pleasure and I trust that you will not forget that it is just as important to have the transportation roads between the places you grow your stuff and sell it, that it is just as important to have these roads improved, and you have a part to play in it, as you know how to sell your stuff at a profit or how to grow it successfully. (Applause).

MR. RANDALL: This is my first attendance on an institute of this kind and I am very grateful that the good Director had fixed the institute in the place he had because as I came down over the hills in my own county and came down to Lancaster county with her vine-clad hills and beautiful valleys and noticed her beautiful farms and came down into her city and got acquainted with her people. I found that she was rich not only in agricultural lines, rich not only in the beauty of her country, but rich in her proverbial hospitality that makes it a pleasure for people to come and have people to meet.

So I say that in coming here to-day I have no criticism to make upon the way institutes have been conducted. I agree with the gentlemen that has spoken about the bad and hard times they have, because they can testify, if they wanted to, that have been in my county or traveled over the hills on Sabbath day twenty to twenty-five miles. I appreciate that, and sympathize with them on that question because I don't believe in working on the Sabbath day, and I don't believe that men ought to be compelled to work on the Sabbath day, and I deplore the necessity of having an institute on Saturday night at a place twenty-five miles out; but when we have it at home we have the court house and then I prefer to have the meeting on some other night because people do not want to come in on Saturday night. I think it is better and I think it is necessary for the lecturers that they should have time to rest and to write and to go to church on Sabbath day instead of riding over the hills. Now the Director has done good work in fixing the institutes. He has sent lecturers both ladies and gentlemen, and they have done excellent work and cannot be criticized for the work done, because the work shows it self and that is proof. Our farmers,—of course, we are living in a small county. Our farmers have cleared up their farms and are farming scientifically since the farmers' institutes started and put a little money in the bank besides.

Now I want to tell you that I was going to ask the Director to give us a little more, but when I came to Harrisburg I was knocked out because the appropriation was going to be cut down and we would get less than we get now. What a wonderful thing that would be! To curtail the business of the farmers of this State, to cut down the appropriations that are used to teach the farmers that which they want to know and what they must know if they succeed in arriving at the top of the ladder. I heard last night a lecture on "What is the matter with the Pennsylvania Farmers." I say one thing wrong in Pennsylvania in my estimation is that they don't stand shoulder to shoulder and say to their Legislature we want our share of the money appropriated in this State and we want it put to the greatest advantage and best advantage that it can be put, the agricultural interests of Pennsylvania. Everyone knows it is a great interest. Why we boast in our county of our oil and gas and down here you have your iron and coal, but there is none of them compare with the lessons in agriculture, but still they go into the Legislature and get by some plans or other larger appropriations for most anything along these lines while the farmers get small amounts appropriated to agriculture. Can that be remedied? Yes, it can be remedied by standing shoulder to shoulder, by doing just as they do; give them to understand we have to have that and are going to get it. Just yesterday they appropriated and opened up a way where they can spend ten million dollars to extend the Capitol by appropriating $250,000 now. Yes, it is a good bit, and I want to tell you that men passing over the afternoon of life will never live to see the end of it. That ten or fifteen million dollars will be spent of the State's money to carry that out and if there is no more money for agriculture they will spend that. I say that ought to be broken up.

Another thing, there are some appropriations ought to be made to go to the counties to reduce the local taxation which we know bothers us more than anything else. Now the Legislature in its wisdom thought that we should not have the right to vote upon the question or should not submit the question of local option. They say you cannot have the privilege of voting upon it. Now sir I say if they are to fasten that upon us, if they are bound to give the saloon, these primary schools of the devil, full sway, that we should have the money derived from them to be devoted to agricultural interests in the State of Pennsylvania; every dollar of it. Now if we put our shoulders to the wheel, I tell you if we pull together they will listen to you. I have been there myself. I am a Missouri man that is, you think I am. We can fetch it as sure as we are here to day by working together and in the right direction and make them appropriate enough money for agricultural purposes. We can appreciate and increase the benefits by experiment stations and State College and Farmers Institutes, sending out bulletins and putting the information into use and there should be enough money appropriated and sent to carry out all of these things and I say we can do it.

Now one thing more. I want to make a suggestion. I have no criticism to make of the county institutes. They are doing noble work. But it occurred to me, Mr. Chairman, that the itinerary of the speakers should be arranged, could be so arranged throughout the State so that they would have their Sabbath rest and let them come back to the Normal Institute the following year and let the leaders make a report, written or oral and have it printed in the proceedings of this convention and have them let the people see what progress has been made in the counties and wherever there is anything necessary to be remedied let them state it and if it hits us poor county chairmen all right, we will stand it. If that could be done and the itinerary so arranged that these good men that come around and assist us and do such good work could make a report to this convention and have it printed, then we could tell how we were progressing. Because we must progress. We cannot stand still. We must, as the gentleman said last night, go to the top of the ladder. We must go on and if that would do it I only make the suggestion for your consideration, and if that can be done it seems to me there will be a little more knowledge of the facts as to whether we are progressing or not.

MR. LIGHTY: Ladies and Gentlemen; I want first of all to make a plea for our county chairmen. Perhaps it was said before but it will bear repetition. I want to say that I would like anyone to go through the State of Pennsylvania and try to find a better, a nobler and a more honorable body of men than the men who have charge locally of the farmers' institutes in the counties of the State of Pennsylvania. They have treated me royally from one end of the State to the other. Brother Herr says that I have never been in his county. I know that the brother is a cantankerous fellow and I have kept out of it.

I want to make the plea that Brother Peachey made. I think there should be a clear understanding about that matter. I want to say to you, my friends, that I don't believe up to this time I ever found a man who could do seven days work in a week and continue it more than about two weeks until he was out of commission so he was unable to do real good work. I made it a rule for the past two years not to do any labor on the Sabbath day, particularly when I was in the institute work, and I want to tell you, my friends, that the county chairmen, not only one of them—I look at one just now, Brother Glover, went out of his way quite a distance to get some men to come and take charge of the Saturday afternoon and evening sessions to let the State lecturers get out and get a little rest, and every county chairman made strenuous effort to do this because before I started out in the work last fall I just kindly requested that they make arrangements so that the State lecturers could have the Sabbath rest. I believe that we should try to give the greatest good to the largest numbers. I believe, my friends, that there are places in the State of Pennsylvania where it is necessary to hold Saturday evening sessions. I believe that you have got to get the people out to do the missionary work and that you have got to hold a Saturday evening session and there is lots of territory in Pennsylvania where there is missionary work needed and we cannot do the missionary work unless we get the people out so that we can talk to them face to face, and Saturday evening is the only evening we can get them out. In the older places where I have been and where they are more up-to-date there is no trouble at all to get them out any day in the week or any time, but I believe there are places where we should hold the Saturday evening session and under these conditions I am still willing to do a little work if it must be, for the good of the cause, on Saturday night. But I want every county chairman to use every influence in his power to eliminate that Saturday evening session and to do it, please, so that the lecturers can find a place that will correspond with the description that Colonel Woodward gave a few minutes ago. When I am at my own home, when I do a good day's work, I usually take a hot bath in the evening before I try to rest. If I go out into some parts of the State of Pennsylvania I do not find in that hotel even that one bath room that Dr. Hunt spoke about that they had over there at the hotel in Germany. Don't find even the one, so I have to wait until Saturday night and I tell you I go pretty soon for the bath on Saturday night and if I cannot have that bath on Saturday night I cannot keep the Sabbath day holy.

MR. BLYHOLHER: We have heard considerable about the Saturday evening meeting now and I think it is a matter that resolves itself entirely into the hands of the county managers. I do not believe that it would be wise for us to pass a resolution here to eliminate the Saturday evening meetings. As the last speaker has said, there are localities and places where I think it is just as necessary to hold the Saturday evening meeting as there is in any place, but I do think that if the county chairmen use the proper discretion and judgment that they can provide and so arrange the meetings in their counties so that these men will have comfortable places to rest after the Saturday meeting, over the following Sunday, without violating the Sabbath so very much if they don't want to. Now I have done this on one or two occasions: I conferred by writing to our Director of the meetings. I found that as the dates were set in the book I would be compelled to travel a greater distance and have my men out in the county on a Saturday evening where we could not secure that entertainment and bath that they deserved, so with his permission just changed the dates of meetings and therefore found places so that they could rest over the Sabbath day and go to church, too. I hope they did. I always advised them to do so. So that I think it is a matter that we ought to refer, and I am glad this discussion came up and I am sure every county chairman here will take this home with them and arrange accordingly; so I would not have the managers adopt any strong rule on this matter not to have a Saturday evening meeting because there are localities where we can reach the people on Saturday evening where we could not reach them at other times.

There are other things to talk about. It is all well and good to instruct the farmers in the matter of producing more and making two blades of grass grow where but one grew before, but it is just as important to instruct him in other matters affecting his welfare, and one of the live questions that I think he should be instructed in is on the taxation question, to show the people of the State just exactly where the farmers of the State stand in the matter of taxation, and I want to say before this institute that this is one of the live questions for us and for the instructors and lecturers to show to the farmers just exactly what position they occupy on the taxation question and I think it is something that will wake up the farmers and the farmers' institutes if they stand up and speak on that question and it may be so that we will have equal taxation on all classes of property in Pennsylvania. Many of them will stand up and make that assertion; so that I hope in the future that question will be taken up by the instructors and that they will study the question and find out exactly what taxation is placed on each class of property in this State.

Then the school question ought to be discussed more. I think there are vital changes that ought to be made in our country schools and by discussing matters in farmers' institutes we can arrive at some conclusion and the farmers will be benefited. So I would say that is another of the questions that ought to be taught.

Another thing that ought to be taught—I hesitate not to make the assertion right here although my good brother right in my rear stands at the head of one of the greatest farmers' organization in this section—I want to say that the farmers' institute lecturers ought to teach the farmers to stand together when they go into this organization or that organization or whatever, and show the power of organization and what can be done if the farmers stand together, which we had a lesson of on Monday afternoon. So that I say that is another question that ought to be talked up in the institute, the power of organization and the power of standing together and why that power is necessary.

These are a few things that on the spur of the moment occur to my mind that ought to be taught in these farmers' institutes.

MR. BARNITZ: Mr. Chairman and Gentlemen: While these gentlemen were speaking I was trying to find out how much religion I had left after travelling around on Sunday. It was particularly hard on the preachers and our corps of lecturers had two preachers in it and it was a little bit new to us but we were somewhat relieved in the matter. The chairmen had heard that there were preachers in the crowd so that the congregations very kindly arranged for us to preach in the towns where we stayed Sundays. Now I did a great deal of thinking while Mr. Peachey was talking and I want to say that I know that it was all conscience for I remember out at Tioga when I was sick in bed on Sunday that he and Mr. Fassett pulled me out of bed and made me go to church, and the next Sunday Mr. Peachey happened to be sick and I pulled him out of bed and made him go to church, and that second Sunday though we fellows had to travel that day. There were three of us. We attended three church services and I had the pleasure of preaching once. When I went home the people wanted to know what sort of fellows I had travelled with. I said, good men. What did you do on Sabbath? I said, last Sabbath we went to church three times; we heard three different preachers. And I want to say that I am proud to hear such a discussion here, for I want to say it sort of stretches a fellow's conscience away out until there is not very much temper left in it when he has travelled here and there on Sabbath day, and especially a preacher who was in charge of a church at home and had another minister filling his pulpit. I wish that could be in some way arranged. It is a very difficult question to decide, but it ought to be for our comfort and for our conscience. Isn't that true?

I was thinking of the county chairmen at the institutes I attended and how nicely they treated us fellows. I suggested to some county chairmen the unnecessary questions that were handed in that killed so much time, and I want to advocate here this afternoon the written questions. I don't know how you feel about that but I find that there is lots more hot air in the written question than the question than the question that a man thinks over before he sends it in. There is a whole lot of unnecessary questions. I remember one lecturer was kept on his feet an hour and a half. Seeds here—is that so? Lots of questions that he had answered in his talk and questions that would not have been asked if they had been handed in to the Chairman, and then the Chairman had a conscience and left out the foolish questions. Now a preacher on a lecture corps in a certain sense is in an unenviable position. You ought to have seen. We were consulted about all sorts of questions. One lady wanted to know why it was that there were two preachers on that lecture corps and they didn't open the exercises with prayer. I felt like saying: "My good sister, come right back here if you need prayer so bad and I will pray for you." That was a question that came up many times, the question of prayer, and I had the privilege of solving it pretty often for when the regular preacher was not there the preacher on the lecture corps was put into service. You have been reading about these trials for heresy. I want to say here that I do not believe it is necessary to open farmers' institutes with prayer. You may have your opinions of that but I have mine. It is a matter of business. I advocate that the people ought to do their praying before they get there and back their prayer with their hustling for the farmers' institute. Just as in a church that I took charge of not long ago. I walked down and I said, "Now we will take the offering," and when the plates were returned they stopped for me to offer prayer over the collection and I didn't offer it. I said, "My friends, we won't have a prayer over the collections." I said, "It would not matter how eloquently nor how long I offered prayer, it would not make that collection any larger and it would not go any farther and what is more, if there are any here who have not given to their ability it would not excuse their conscience." I had to leave out some of the questions that came in, and we all laughed, and I believe in a good hearty laugh and good jokes in our talks. As I say, the preacher is in a somewhat unenviable position. He is advertised too much. Why everytime I got up to talk on chickens the chairman would say, "Now this man knows all about chickens. He is a preacher and he is full of chicken." Well, you ought to see the questions. Here was a lady sent a question up to me saying: "I have just had a proposal of marriage and it came from a man who is not a Christian. Would you advise a woman who is a Christian to marry a man who is not a Christian?" I saw the preacher sitting over in the other corner. I said: "I am running a chicken ranch. I will refer it to this preacher over here;" and I walked over and he got scared and he said he hesitated. I said: "I guess I will have to answer this." I told that lady she had better marry him quick for it might be her last chance.

I want to emphasize what this brother said about Sunday. We are away off from our homes and the comforts of our homes in most places, and what is more we want to go to services and have the rest so that we can enjoy the church services and do our duty as Christians as well as lecturers.

MR. KERRICK: I have no fault to find under the present direction of our county institute management. I do not know but Brother Peachey might be insinuating on me; still I am not positive. I want to say for Brother Peachey and my friend Cornman and Preacher Cox, they did very efficient work in Bradford county.

It seems to me that we have been far from the question this afternoon, how are we to benefit or better the institute? I am not prepared to say. I think, as has been stated by my friends over on the right, that what we want is to stand together shoulder to shoulder and let the people in the State know that the farmers mean to stand by their organization. When the members of the agricultural societies and members of the State Board, the Grange, the Farmers Alliance, all acting together, come down to the Capitol of this great Commonwealth united, shoulder to shoulder, the members of that Legislature will understand that we mean business. We are coming to that, I think, ladies and gentlemen, and I want to congratulate my friend, Brother Martin, for the success that he has made out of this agricultural society. We had the honor of having him with us in Bradford county and the people remember the lecturer and the Director with a great deal of respect. I assure you, ladies and gentlemen, that the work in Bradford county has resulted for good and I am asked from different parts of my county for more institutes, showing that we need more money in the great Commonwealth of Pennsylvania to run these institutes so that we can get to the people. Now, gentlemen, let us get down a little closer to the question. I would like to hear from some of these older members. I don't know how we might better conditions. The thing to do is to get direct to the farmer and get him up to the institute, get him interested in the discussions, in the rations that we feed to the cow and how to produce more corn, more wheat, and so forth. That is what we want to try to do and in managing that matter, if we work it right, we can get them all interested.

As far as Brother Peachey's Saturday evening matter is concerned, I think if he had a good helpmate that there would be no trouble about Saturday evening. Ladies and gentlemen, I thank you.

PROF. MENGES: Mr. Chairman, I don't think that we have discussed the subject this afternoon but a number of things have come up here that I think we ought to bring to a point. The first thing is the Saturday evening session. I don't think that any of the institute managers want to eliminate the Saturday evening session. I know I don't. I would be mighty glad to get rid of it. That is all right. But if it is for the good of the cause I am willing to sacrifice a whole lot for the cause. That is my idea about it. Now then here is one thing that I have been thinking about it:—Mr. Blyholder brought out the idea—That very often we are away out there somewhere in the corner of the county; no railroad; no hotel; and the only possible way of getting out of that place is to drive away on Sunday. I have travelled last winter—one time we drove 24 miles on Sunday morning. I don't know exactly who to blame. If I knew I would say a little more. I don't know exactly who to blame. I had a notion that if the managers of the institutes and the county chairmen would get together—I better put that this way: if the managers of the county institutes of the sections, if they would get together and start the itinerary at one end of the county and from that county to the next county and in that way have it so arranged that when Saturday night comes these men can be in a place where there are hotels or railroad facilities to get away to hotels, I believe that could be arranged; if the chairmen of the counties of the sections would get together with the manager of the institutes and simply mark out an intinerary from the beginning of the institute to the end of them, that they could manipulate it in such a way that all these difficulties that Mr. Peachey is finding fault with, and that I sometimes growl about, and Mr. Lighty don't like, and the rest of the fellows walk away from when we want to stay, I say I believe that that thing could be arranged and managed so these difficulties could be done away with. I am not ready to offer a resolution but I believe the chairmen of the various sections in the State ought to get together with the county chairmen and make out the itinerary from one end to the other so that we can be put to that place where there is comfort and the possibility to get away if we want to.

The CHAIRMAN: We will have to limit each and every speaker to five minutes.

Mr. Shuey made one reference here that I would like to answer if I may be permitted. I am one of the men that is here to say, and I have said it before at these meetings, I don't want any county chairman to serve without pay. If any men in the State of Pennsylvania deserve pay for the services they do and the services that are telling, it is the county chairmen of the farmers' institutes of the State, and I say they deserve pay.

MR. JOEL A. HERR: Mr. Chairman, I am sorry to say what I have to say. I believe the object of the meeting was to talk about or have a conference on the farmers' institutes, the better manner of conducting them and how to make the best institute; but we have drifted about and have been talking about the subject of Sunday work and the hardships we have to endure and these very fellows are tumbling all over each other to get on the institute force. I don't know whether that is correct or not. I want to say we ought to come down to the subject, how best to conduct an institute and get success; the impressions we leave on the people is what we want to know and instructions in the management of our county institutes. I am not going to make a long speech. We want to impress the people with the importance of our calling. That is the first and foremost thought that ought to be brought out before the farmers' institute, to teach the farmer to respect himself and his business, and if we don't do that nobody else will respect us. This is the first and most important point to make. In order to do that we must speak respectfully of our calling; we must show how to make it more agreeable, how more convenient, how to better our home conditions and circumstances of our assistants and make it more desirable to keep the boys and girls on the farm and to make farming the great business it ought to be. We ought to learn to co operate with each other and to help each other; and all these things could be brought about by the farmers' institutes. There is a great scope of work for the farmers' institutes to do, and the question narrows itself down to each community, what shall we do that will result in the greatest good for our community.

I have nothing to say about the care of the farmers' institute speakers. They are well enough cared for. There are instances in which they suffer. I know that I have endured with them and I never was much the worse of the circumstances. If I accept the work I must accept it under the circumstances it comes, and I have always tried to manage to excuse the speakers when it was necessary that they should go home and to use our local talent. Another thing, is to get the people interested, get them to take to the work, and to ask questions, and let the institute lecturers set the conditions before them and instead of talking merely to be heard, talk to say something and tell the people something they ought to know.

MR. WILSON: Mr. Chairman, I think about the Saturday evening meeting, that could be avoided by the county chairman himself. He has three or four days of institute, owing to the size of the county. I was saying this, that the county chairman alone could arrange for the avoidance of any trouble on Saturday evening. He has the number of days for his institute and he can arrange it. If he has a place where there is no good hotel accommodations, let that place come first in the week and then wind up where he has better hotel accomodations and where the man does not have any travelling over Sunday.

Now one of the questions which I think is before us to-day is, how to better our institutes. That one we should have spent this afternoon on. I think the best way to get interest in the institute is for the institute manager and his friends to talk up that institute. You cannot go out for a week or a month, but talk everytime that you get an opportunity; talk to the neighboring farmer, say something about farmers' institutes, tell him what a good thing it is and ask him to come out the next time to the institute; tell what you try to each them, that they are doing things; have everybody and anybody come to that institute in your neighborhood. You cannot take a week to talk about the institute and get interest created, but you can take time to do it. Just as talking about the county fair. You would not expect to prepare for the fair a week or two before. I have been a director of the county fair for many years. We commence months before and talk it up to everybody we meet. And it is the same way we should do with the county institute. Why, take the preachers; they tell their audience what subject they are going to preach on the next Sunday and sometimes they announce a series of sermons away ahead and to-day they are advertising their subjects in the papers away ahead, and in that way they create an interest and get the people talking about it; and you will find the best way to get up interest is to talk to everybody you meet about the farmers' institute.

MR. SCHULTZ: I don't want to take up much of your time. I haven't anything on your subject, but I am interested in the talk the doctor gave us on roads. I believe the success of the farmer brings up with it the question that he eventually must make the mud roads in his neighborhood. I tell you what I did at my farm. We have a road running through it and half of the farm lies on each side of the road. Everytime it rains we have a split log drag and my men hitch on to the drag and drag that road and that road is in perfect order and keeps in perfect order if you follow it up. You want to have the comb so the water goes into the ditches instead of standing on the road. Let the farmer understand that he is responsible for the road passing his property. The sooner we can do that the better for us all. We must make the road or pay for it and if we make it ourselves we know it is right. If the farmer knows it is in poor condition it is a reflection on his farm, and eventually we have all our roads made, all the mud roads. We can never get away from the mud roads. The stone roads should be made by the State. This is one of the ways to do it, and I think if we would try to do that, that would be a great relief on this road question.

MR. HULL: There has been considerable said this afternoon as to what should be done to interest the farmer. The time has never been within the history of business in this country, the time has never been within the history of everything in this country, when the farmers have been more interested in their calling than they are at the present time. Now I am not willing to give any one department full credit for bringing this about. The Department of Agriculture has done its part without discredit, but the agricultural press has also done its part, and the agricultural colleges and the editorials in our metropolitan farm press. I am impressed more and more with the growth and progress made in the science of farming. Our experiment stations are doing their work and, all in all, I think that the time has never been that the farmers were more generally interested in their calling than they are now. Only a few years ago there was a call made at one of our round-ups by counties so as to know what the effect had been in the trial of raising alfalfa. In very few counties had there been any success. To-day, through the impetus given by our college here, the Department of Agriculture here, the metropolitan press, we are succeeding in all the counties in raising alfalfa, and it is a farm crop that we cannot do without. The spraying of fruit trees and the spraying for potato scab and fungus growth in the different plants have received great impetus. The farmers have got the information necessary to combat these and they are doing it, and the time is coming and near at hand when we will not only be benefitted by the instruction at farmers' institutes, through the press and bulletins, but a better knowledge of the insect foes will be brought about and the means brought about as to how to combat them, for we are going to raise better, fairer fruit than we have been, so that it has been a blessing in disguise. Now I feel that the Department has done its part, that the press has done its part, and that our State College is doing its part, but one thing I want to say right here, that with all the letters that I have received to use what little influence I have in bringing about experiment stations over the State and for my influence over our representatives to have an appropriation for these different branches, I want to say that I am in favor of one central place. I want that the State Farm, and I want that supported so that it will be a credit to the State, and I want it so well supported that it cannot be discounted by these experiment stations which are springing up, which will grow year by year, becoming top heavy year by year, and require greater amounts of money to be appropriated for their support. Let there be one and that one well supported.

DR. CONARD: It seems to me that we as county chairmen could do very much to assist the Director in arranging the schedule or program for we are all acquainted with the lines of travel in our counties. We have gone over the most of the county and then we know what railroad stations in the county will run us nearest and the best line of travel and best hotels, and if we would, in making our suggestions for the places for the institutes put them in the order that would suggest the line of travel and say that it would be very convenient to travel to those places in the order given, or something of that kind, it would give the Director a little information that we have at hand,—because we live there,—that he would have to look up and it might help the thing along.

I want to talk about the movable schools. The movable schools seem to have led up to a better and more thorough discussion and consideration of the few topics than the institutes. There has been three topics assigned to each movable school, namely dairying, horticulture and poultry husbandry. Those are the three subjects assigned for discussion. The schools consist of four days and evening sessions, allowing two days for dairying. Now, in order to consider dairying thoroughly in two days why you want to take it up in certain order. You want to take up a certain feature first, another second and another third, and so on, and there is nobody knows better how to do that than the ones who are going to teach it. The ones who are going to give that instruction can tell better how they can do it best than any other ones. It will not do in getting up the program for the movable schools to make it exactly like an institute program. The county chairmen will get them out of order, not because they want to oppose the system adopted by the experts but simply because they do not fully realize the difference between the movable schools and the farmers' institutes. Now, I have some topics that are not dairy topics at all and it has so happened that questions were taken up not on the lines of dairying, taking the mind entirely away from the subject under discussion and instead of having a dairy session it was absolutely a miscellaneous session. These programs are printed in advance of our arrival and they are distributed very generally. Nearly always the county chairmen have taken an interest and these programs are distributed out amongst the farmers and they come at certain times expecting to hear certain things and they go away disappointed because we have to tear these programs to pieces. We cannot help it. We have to do it in order to fulfill the logical mission of the movable schools. So they are very generally and very frequently torn to pieces, more or less. I think the county chairmen should consult a little with the Director as to how these programs had best be made. I want to make this suggestion: That in preparing these programs we set certain days for certain subjects exclusively. That is, if we have four days session, give the first and second days exclusively to dairying and the third day say to horticulture exclusively and the fourth day to poultry husbandry exclusively. Now that seems to be a better and more convenient way to present these subjects, and have no other questions injected into the dairy sessions but dairying and the same with the other two subjects. I make this suggestion that the county chairmen confer with the Director and get the necessary information and get the programs more in conformity with the object of the movable schools, that we may spend more time on one subject, going further into detail and getting more out of it.

MR. T. J. PHILIPS: I do not know whether it is hardly worth while for two Chester county men to succeed each other. I suppose Secretary Martin and myself are the only two men possibly in this room who can speak of the institutes from the beginning to the present time. We were both Members of the House and Members of the Agriculture Committee when the bill creating this department became a law. You remember that in the beginning we imported our institute men from other states, Ohio, New York and so forth. There were no men in Pennsylvania thought fit for the work. In a year or two men in this State were equipped for the work. How well they have done it I leave to you to judge, and I speak freely because I have been interested from the beginning until a comparatively recent time. I think I am capable at least of judging what has been done, what has been accomplished. I was prompted to take this thought because of the meeting day before yesterday at Harrisburg to get those city men who control these commitees to give us the funds we need. If they would know of the good work and of the profit in dollars and cents that has been accomplished through this department I am sure they would never hesitate before making that appropriation. We were told this morning that the poultry industry in Pennsylvania amounted to over $20,000,000 in eggs alone, and while I am no poultryman, still I was a dairyman and know more about that end of it. I have not the figures but I honestly believe if it was possible to gather them that $20,000,000 represents an increase of egg production due to the farmers' institutes far greater than any annual appropriation; so that in just that one line of increase in the chicken industry the farmer is entitled to that apropriation.

But that was not the line of thought I wanted to speak about. I speak freely on the subject because in a sense I have gradnated from the institute work, but I have been over the country and I find that it has spread abroad in this State a great influence. They have had a great influence. As one of our friends on the other side of the platform said, possibly no greater influence has been exerted than that of elevating the farmer and his calling. He did not consider himself a business man. He was not a professional or even a good business man. To-day he ranks among the first in the land and to be a successful farmer he must be a good business man and he is so looked upon by the youth. Only within the last year a young man came to our town as principal of our high school. He came from another county, an entire stranger to me and after he was there for awhile I learned that as a boy he had heard me discuss a problem in a German county town at noon one day during an intermission in the session of the institute and he said that here was a farmer who could stand upon his feet and talk intelligently. It was an inspiration to him and he determined then and there that he would secure an education and that he would be able to talk and express his thoughts, stand upon his feet and express his thoughts as that farmer did. And so this shows that you are unconsciously doing a great work in this State, that you know not the good of and no man will ever know and it behooves you to be careful as to what you say and what you do and the manner in which you deport yourselves.

I believe that one of the greatest works of the farmers' institutes in this State has been the elevation of the farmer's wife. We have preached better country homes and from my own personal knowledge I know that the institutes have made thousands of better homes. We have had the farmer spend a little of his money for modern improvements in his home and to-day thousands of them have them because the institutes put the thought and desire in their minds to have them. We have done much to relieve the monotony of the woman's life upon the farm. I was going to say drudgery, but I believe if the institutes will continue along the lines of teaching the doctrine of better homes and elevation of the farm woman in making her labor lighter and getting her hours of rest and all that tends to elevate, the institute workers of the future will continue to do the good work that has been done in the past.

MR. A. P. YOUNG: As I represent one of the counties which has been endeavoring to hold movable schools I want to say that in my own county the movable school is superior to the farmers' institute in that it gives more time to discussion of questions that are taken up. They can be gone into more thoroughly than they can at the farmers' institute and consequently are an advantage. But as to the making up of the program for the movable school, we have never attempted that in our county. We have depended upon the symposium sent out by the Director of Institutes and the arrangement of the topics has been left entirely to the speakers. We had Dr. Conard in our county and Prof. Cooke there and they took up the dairy question, and they showed the handling of milk and all that kind of thing, and judging of cows, went to the cattle and looked over the cow while they explained the different points. Now our schools heretofore have been confined to the topics that were mentioned this afternoon, between three speakers. Now I think it would be well to vary that a little. Let us have the cereal question taken up and perhaps the raising of stock in the different departments, so that we are not confined, so that it does not become monotonous. To my mind the growth of the agricultural interests depends more upon the movable schools of agriculture than upon any other one thing. The institute has become rather lagging. It is no longer as interesting as it should be and the topics should be taken up and treated by men equipped to treat them and capable of treating them and treating them fully so that the people can come there and get ideas and they can go home and sleep over them and come back the next day and get questions answered that have come up in their minds as they thought the matter over. In these things the movable school is superior to the old farmers' institute.

MRS. ZEIGLER: I thought I would like to make a little plea for woman's work in this institute work. We are told to say what we thought would be for the betterment and the interest of institutes and I feel that woman has a great work to do along this line. Indeed it is very necessary for the women to be helped and taught along their line of work and if the woman has got her share of help and encouragement she can make the satisfactory, solid home that that farmer needs for his rest and recreation when he comes in. I think it is just as necessary for the woman to have some help and encouragement because her work is necessarily more confining than the man's. He goes away from the farm and out to the stores and the town much oftener than the wife does. It is that that causes the humdrum of farm life; and so even if she is a reader she has no time to take along that line and, as I say, life becomes more of a drudgery unless she has help to see the beauty and sentiment of farm life. Now while I think farm life is the life to live I know a great many people think it is lonely, but I would not exchange the farm life and kitchen for the city life, and if we could get our farm men to see this and realize that their own homes would be happier, what a blessing that would be. And then we need to see that we have some help to care for these little lives that are entrusted to their care; this child life and child nature. Help them to teach them purity of thought and action. I see often that we have lost sight of the high sense of honor that our fathers and grandfathers had before us and it is because in this hurry day and age we do not give the right care and the training to our children that we should. We allow the cares and worries of the day to engross our best thoughts. That is all wrong and I know that women will come out to the institutes if they know that there is a woman speaker on the force. I have been at institutes where they came to me and said, this is the first time they had a woman speaker there and they hoped the Department would never give an institute without a woman speaker. And I think if the chairmen would ask to have one of their speakers a woman on the force and send out good earnest workers who have the interests of their sisters at heart that the institutes would be very much improved and bettered and the uplift of the farmer's home will be accomplished in a much shorter time. I know there are men talk along this line but not as many as they should have, and I think that the women who can sympathize with the women and that have gone through all that is required of the women on the farm, can reach the women's hearts much more readily than the men speakers can, and I think it is very necessary that they should be on the force.

Now I have been told that some of the men do not care to have ladies on the force with them. I don't know how true it is. I am sorry if it would be, and I think that any woman that goes into this work makes up her mind to adapt herself to circumstances and take things as they come and will not do any fussing or grumbling if they meet with any unpleasantness any more than the men. Of course, they will have to accustom themselves to be ready when the team is ready so that they do not keep any one waiting, and if the men feel so disposed to show them any little attention or help them along with their luggage the women will be grateful for it. If the women have luggage they feel that they are capable of taking care of their own. I think in that way the men will not object to women on the force, and I hope the day will come when there will be more ladies on the force.

MR. BRONG: Mr. Chairman, I hesitate at this time to introduce a new subject but the question that I will ask can be answered in a few words. The question is this: In our county—I suppose there are others like it—we have more calls for regular institutes than we can supply; that is, we have calls for more places than we can locate the institutes at. There are certain of these places that have had institutes constantly, not every year but perhaps every other year or something like that, and others of these places that have, as far as I know, never had an institute located at them and therefore the atendance, we anticipate, would be rather light. In fact, last year we located an institute at such a place where there never was one before and our attendance was light. Now the question is this: Is it best to locate an institute where there never was one and where we anticipate a small attendance or to locate them where they have been and where we know we will have from three to four times the attendance?

The CHAIRMAN: In reply to that I would say if it is a good farming country and the farmers want to hold an institute there, give them a trial and if they make a failure the first year charge it up to them and don't go back. That is the way I have adjusted some of the troubles in my county.

I feel that I have got one of the counties of which I believe the Secretary is proud with regard to the attendance in each and every year, regardless of weather conditions. The farmers' institutes of York county have bettered the schools, bettered the homes, bettered the farmers and bettered the Christianity of our county. We have in the last two years been holding an institute in a hall adjoining a hotel and even on Saturday evening we have had good order and I am proud of the people, for during the institutes we have not been troubled with drunkenness and we have never been disturbed. Our hall opened right into the side room of the hotel and it was just as orderly as any church that I ever sat in in Pennsylvania and I believe that the farmers' institutes have done a great deal toward bringing about this betterment in our county. We advertise our institute meeting first and after we have selected the places, on the sheet which I send back to Mr. Martin I designate; for instance, if you are coming to our county on the eastern side such an institute should be held first and following on, coming down in regular order so as to make it convenient for the speakers, and in the last seven years I have always been able to locate the speakers on Saturday night in a place very acceptable to them.

DEPUTY SECRETARY MARTIN: I have been very much interested in this discussion. It gives me information that I cannot procure in any other way. Sometimes, you know, men when they get into the spirit of discussion will say things that they will not say in cooler moments and they are apt to tell the truth there. I was so much interested in that extended discussion about landing our splendid lecturers on Saturday evening out in some remote section of the State we would almost have supposed, had we not known Pennsylvania as well as we do and the hospitality that is so universal in the State amongst the farmers, that we had a lot of territory in Pennsylvania that compared with the wilderness. Now, my friends, just a word or two along this line. I think I am able to appreciate because I have travelled with these gentlemen in season and out of season, in storm and in calm, and I have experienced hardships and I know they exist.

Here is the section known as the First Section. I notice, and I have not time to go over the entire section, but just one or two places that the gentlemen stopped at over Sunday in this County of Lancaster. In the first section they started in at Quarryville two days, Lampeter two days and where do you think they stopped over Sunday? Why in Paradise.

A Member: They came to Lancaster every night from all the institutes over the splendid trolley system.

DEPUTY SECRETARY MARTIN: Who would you suppose would have left Paradise for Lancaster.

Now just a word, my friends. There are some things that are possible and some things that are impossible. The most county chairmen understand me with me that when the schedule of places is sent in I take up that schedule and under the act covering it I fix the line of travel to be the most direct and economical in the direction. It is quite an expensive thing, you understand. But when this is fixed if it does not meet the convenience and economy the county chairman fully and readily understands that he can transpose that schedule to the way that will be the most convenient to land these speakers in the most acceptable place to spend the Sabbath day. Sometimes this may not be fully consummated. We are talking about conditions. There are times where away out eight or ten miles in a splendid farming location in Pennsylvania, where the farmers there are the salt of the earth; they have no trolley lines; they have no permanently constructed roads; they have none of these conditions; but they have good farms; they are good farmers, and they are entitled to the very best we have got, if it comes on Saturday night, and occasionally we are landed right out there. I stand up here and affirm to these speakers that it is their duty to these farmers and to this Department to endure the hardships like good soldiers and give to the farmers out there the best that is in them. There is one thing these good farmers have to be excused for. You are the most sociable people in the world and when you get these men there and you entertain them and you know you have good company, and you only once a year have the opportunity to get some knowledge and you want to get it and sometimes you talk them to death. They will have to put up with that. I am going to talk pretty plain with these leaders of sections. I know it is a splendid thing and I appreciate it, to get a good warm bath once or twice and really I believe a man ought to have a bath once a month whether he needs it or not. But look here: I never went to a farmhouse in my life that they did not either have a good pump or spring of good flowing water and they had a wash basin and tub and a lot of towels and a lot of soap. Ask for the towel and you will have the soap, and rub yourself off until the blood courses through your veins and gives a vigor like it does to everybody on the farm. That is my view of this matter.

I stand here and pledge you that so far as we are concerned we stand ready and willing to fix the schedule of these lines of travel to the very greatest conveniences of these lecturers who are under heavy pressure. We know that and we say to you farmers that you on your part will study their highest comfort and convenience. I know you do that. You have shown your appreciation of this great work in that way, but never yield the point that because your farm is ten miles from the railroad station that you are not entitled to the best that the State can give you in this case. It is not necessary to continue this discussion on this line further. There is just one question I shall dwell upon. I am not a stickler for the Saturday night session. I never have been. Gentlemen of the county, you have fullest charge of that matter. It is in your hands. If you believe the best instruction, the best interests of the institutes in your county will dispense with that session, act upon it but take a little care. Better study that matter over carefully. Do you know that sometimes it is not always just exactly the old farmer that may not go out on Saturday night. It may not be him; but his daughters and his sons, and some of the young people that will be on these farms a little later will be there and take up the home questions, educational questions and social questions and present them to these young people in the manner that will lighten up home and farm life. We are in this business for work, good effective work that will lift the standard of agriculture and hold it up before the world. Thank you.

MR. PEACHEY: I am not here to retract anything that I have said, but I am glad for this one thing if nothing more, and that is that I have gotten you stirred up to think with me along the line that concerns the farmers' institute lecturer, and I believe he has a perfect right in this meeting, as in all other meetings, to stand up for what he believes is right and if he don't care for that personal property no one else is going to and that personal property is himself. No reflections whatever. I only stated the case as I found it, honestly and conscientiously, and if good can grow out of this matter I am satisfied. I know it is the unpopular side, but I want to say to you this, that it has not always been the man on the popular side that was on the right side. There may be exceptions and, of course, we have the rule and you have the exceptions, but whenever the exceptions become more than the rule, greater than the rule, then the exceptions become the rule, and so I hope sometime you will agree with me and will do just like is being done in other states, that Saturday night is left to the speaker and he can either go home or go to the hotel and do the best thing he can, and goes to work again on Monday morning. I have talked with some men from other states and they say this: "Peachey, I am surprised that you people work all winter and are compelled to work Saturday night and travel on Sunday." And one man said this: "That is the only thing that is not a credit to your Pennsylvania institute work." Now I hope I am not reflecting upon any of my friends, and Brother Kerrick, I did not mean him any more than anybody else. I stopped twenty-nine days in Bradford county, that county of magnificent distances. They travel from Dan to Beersheba to get to the institute. I travelled twenty-seven miles—they claimed it was thirty but it was about twenty-seven miles, to get from a farmers' institute and one of the fellows said it almost froze the marrow in his bones. So I only speak of these things. If I said anything that will add to the betterment of the farmers' institute why I am glad for it even though I have taken that unpopular side, and somebody you know must occasionally get on that side that stirs them out and possibly that stirred them up.

MR. JOEL A. HERR: The probability is that Mr. Peachey was intended for a banker because he always has Saturday afternoon off and stops at three o'clock through the week.

MR. PEACHEY: Only intended for a farmer. I am satisfied with that. I am not good enough for a banker.

Deputy Secretary Martin thereupon announced the program for the evening session.

The CHAIRMAN: The institute now stands adjourned until 7.30 o'clock this evening.

Wednesday Evening, May 24, 1911, 7.30 o'clock.

DEPUTY SECRETARY MARTIN: In the absence of Dr. T. J. Ferguson, who was to preside this evening but is detained at the closing session of the Legislature of which he is a member, Mr. W. Theo. Wittman, of Allentown, Pa., one of the poultry experts of Pennsylvania, will preside over the meeting.

W. Theo. Wittman in the Chair.

The CHAIRMAN: One of the leading subjects in the poultry world to-day is utility poultry. The State of New York, through its Legislature, has given the Poultry Department of Cornell University $90,000 and that department with a farm of 54 acres is well equipped with the next year to carry on the great work along the lines of utility poultry. I am therefore sure you will greatly enjoy the lecture to be given now on "The Poultry Industry," by Prof. James E. Rice, in Charge Poultry Husbandry, Cornell University, Ithaca, N. Y. I have now the pleasure of introducing Prof. Rice to you.

THE POULTRY INDUSTRY.

By PROF. JAMES E. RICE, *in Charge Poultry Husbandry, Cornell University, Ithaca, N. Y.*

Mr. Chairman, Ladies and Gentlemen: I do not know how many people in this audience are interested in poultry. I have been trying to find out. As near as I can learn most of you are delegates who are interested in everything else but poultry. I hope that there are a few here that are thinking seriously of paying more attention to poultry than they have already done and with this object in view I have selected slides that will represent some of the recent results of the experimental work, with a practical bearing. Each one of the experiments that I shall deal with have been carried out with the idea of saving money, of making more money out of our hens.

Until very recent years poultry husbandry has been looked upon as a side issue on most farms. It has been looked upon as a business primarily for women and children and men who, having failed in some other line or broken in health, think that they can retire to a little patch of land and keep a few thousand hens and, because it is easy to make a dollar or so per hen, they figure out with a lead pencil that they can make several thousand dollars by keeping several thousand hens; hence many people have gone blindly into the chicken business only to discover that they know nothing about it. And secondly, poultry husbandry as a profession has been looked upon as a great risk, as a hazard, a business for example, which the banks could not loan money on; not a safe, conservative, sane business investment. This viewpoint is rapidly changing, poultry husbandry is just now coming into its own. It is becoming a perfectly safe and a very profitable business when it is carried on in the line of our best knowledge.

The difficulty with poultry husbandry is that we are dealing with so many little individuals; that there is too much detail to look after, and consequently the amount of business that any one person can do is exceedingly limited. But in recent years we have discovered methods of hatching extensively and successfully, brooding in large flocks and very successfully, and the keeping of hens in large numbers for egg production and keeping them by easier, safer methods, and housing them in the large open air houses, and giving them free range instead of the little close "bare yard" conditions; and marketing their eggs as they should be marketed, carefully grading them as fruit people are supposed to grade their fruit, and the hens bred as scientifically as men have been breeding their horses and cattle; and as a result, to-day we have all over the country men who are keeping from 1,000 to 10,000 or more hens and keeping them more successfully than before, with greater profit than we could have expected from 500 to 1,000 hens five or six years ago. These changes have come about by virtue of the careful work by men who have studied and experimented for themselves and by the colleges and experiment stations that have been investigating some of these problems, and I think that as I show you some of the slides to-night you will readily agree that the State cannot make a better investment than in giving money for educational or experimental purposes for agriculture, and to no other branch of agriculture more wisely than to poultry husbandry, because in all these years since the Land Grant Colleges have been in operation nothing has been done for poultry husbandry until very recently. In all this time the dairyman, the fruit grower, the vegetable grower and, in fact, the man on every other important branch of farming has had his problems investigated and they have been getting the benefit of the help. The farmer's boys and girls have been taught these better methods of farming, whereas very little, if anything, of this kind has been done in regard to poultry. So we are just now coming into our own, and poultry husbandry is becoming a business in which you and I can engage with perfect certainty of succeeding and of making as much money for our efforts and for our capital as we could with any other branch of agriculture.

With this brief introduction we will have the slides thrown on the screen.

The first set of slides will deal with the problem of the breeding and selecting of hens for constitutional vigor. In othe words, we are coming to recognize the fact that there are strong fowls and weak fowls, just as there are strong human beings and weak human beings; either born so or having acquired their strength or weakness through their environmental conditions. The pictures that I shall show here will indicate types which I think will be perfectly clear to you, representing the contrast of high and low vitality. For example here (Fig. 1), we have two barred rocks, one a male full sized, vigorous and active one of the finest specimens of the breed. And here you have one of the same breed that has been unsexed. He shows weakness. He is a lifeless sort of a type. You will notice the contrast. The strong male has a large round head, with the heavy curved beak, with large bright, full eye, red comb and bright plumage, in contrast to this capon with small darkened comb, long thin feet, shrunken eye and rather dull plumage. The capon runs because it lacks courage. The other one follows him very quickly if he gets a chance and is afraid of nothing.

In the second slide, (Fig. 2), we have breeds of four different varieties, all pure bred varieties; one strong and one weak in each of these four sets. This shows a strong buff plymouth Rock; here is a weak brother. You will notice that the very action indicates weakness; notice the drooping tail. Here in the strong one we have a deep body, heavy shank, and short thick neck. In the case of the Barred Rock you will find the same traits, deep heavy body with the rest of the body in proper proportions. Here you have an individual that is built on stilts, as it were; a long, lean, lank, narrow spindling type. This chicken weighs at least two pounds more than this one and this is a brother. One is constitutionally strong; the other is constitutionally weak. Here you find the same traits in the Rhode Island Red and in the Leghorn. You will notice in this instance the male with the big flowing tail, with fine large comb, heavy wattles, with splendid plumage, heavy shanks, in violent contrast to his brother here with dropping tail and with the other characteristics as I have indicated. The same contrast will be true of females as males; but this will suffice.

Here (Fig. 3) we have pictures of an experiment in which we undertook to find out what it would mean to the farmer if he would select rigidly in the fall of the year pullets that were of strong heavy body, robust constitution, as compared to some that were more of a delicate type as you see them here. (Fig. 4). Here (Fig. 3) is a pen of 25 pullets of strong vitality and here (Fig. 4) are 25 of weak vitality, and yet there is not a sick chicken in the bunch. No chicken was kept in this experiment that a farmer would not expect to keep. We kept records of these flocks for the year, counting the cost of food, eggs laid, and results of hatching the eggs and rearing the chickens and we did the same thing with the other experiments and compared the results for two years since with the succeeding generations. I will give you briefly the net results. These pullets of strong vitality, (Fig. 3) in their first year of laying gave us a profit of 40c apiece more than the flock here, (Fig. 4). They laid 11½ eggs apiece more. The eggs were more fertile; they had strength and hatched better; the chickens lived better, and in the fall of the year when we brought them up at about six months of age and weighed the pullets and photographed

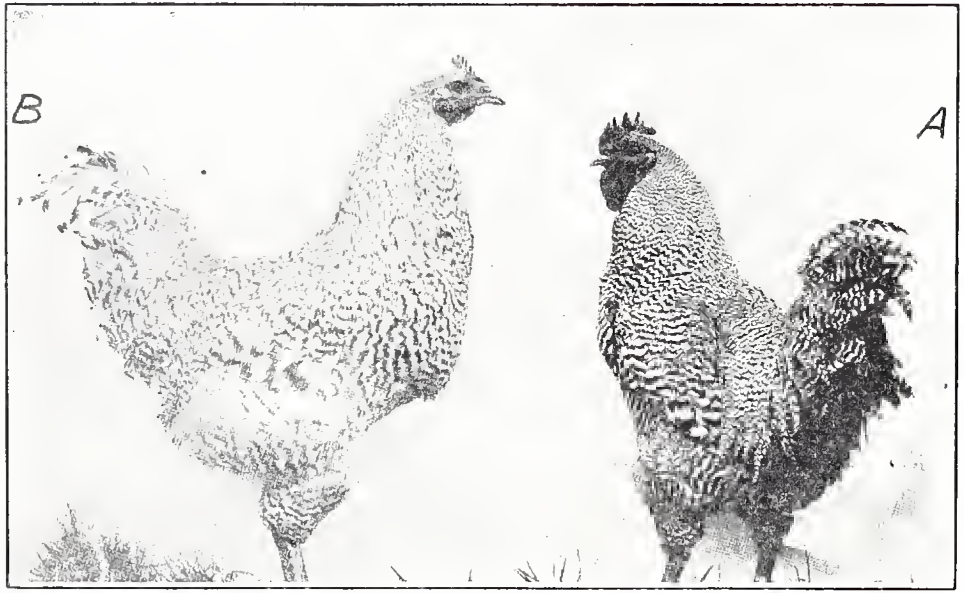


Fig. 1.

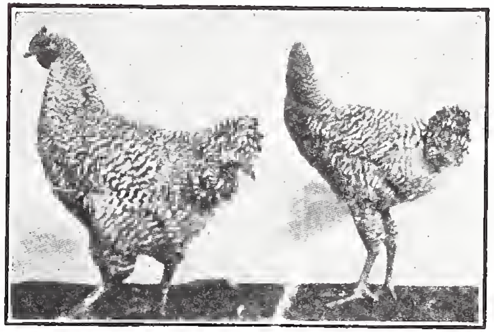


Fig. 2 A.

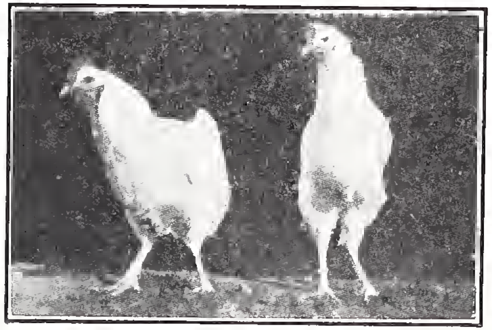


Fig. 2 A.

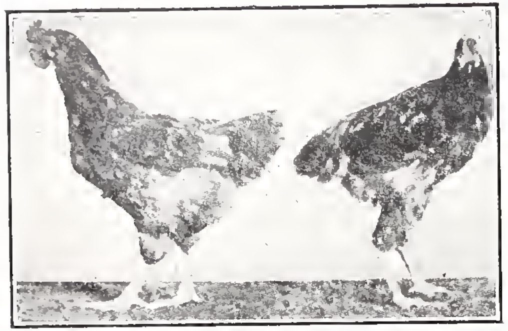


Fig. 2 B.

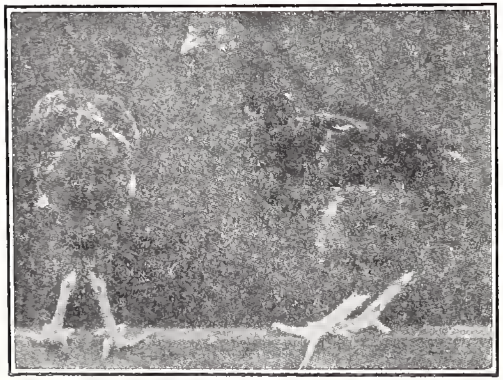


Fig. 2 B.

Fig. 3.

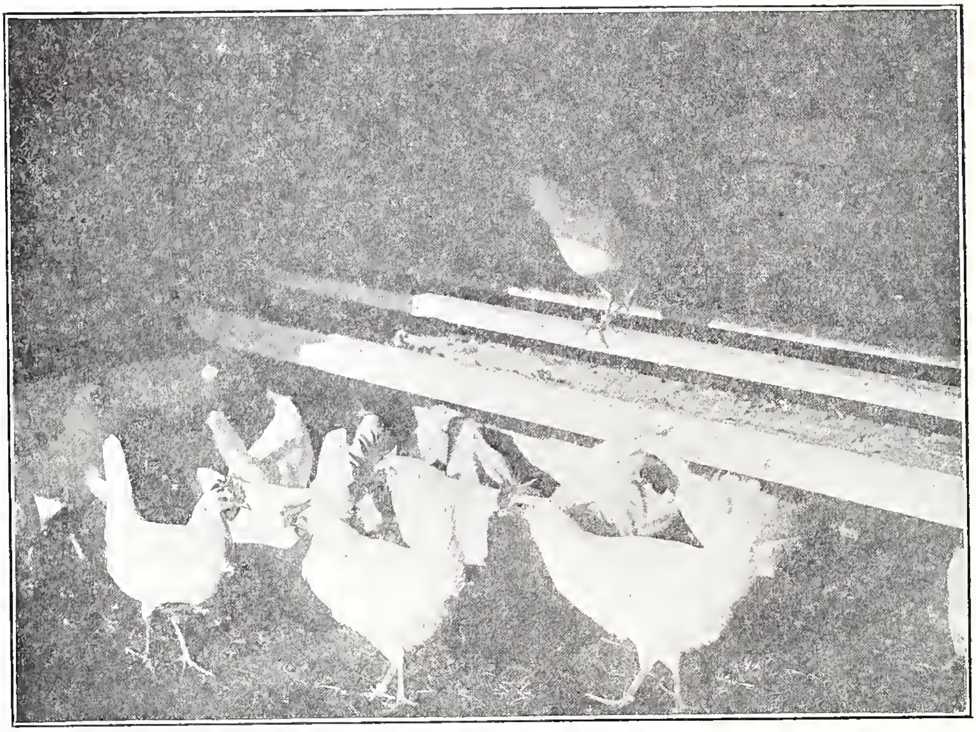


Fig. 4.

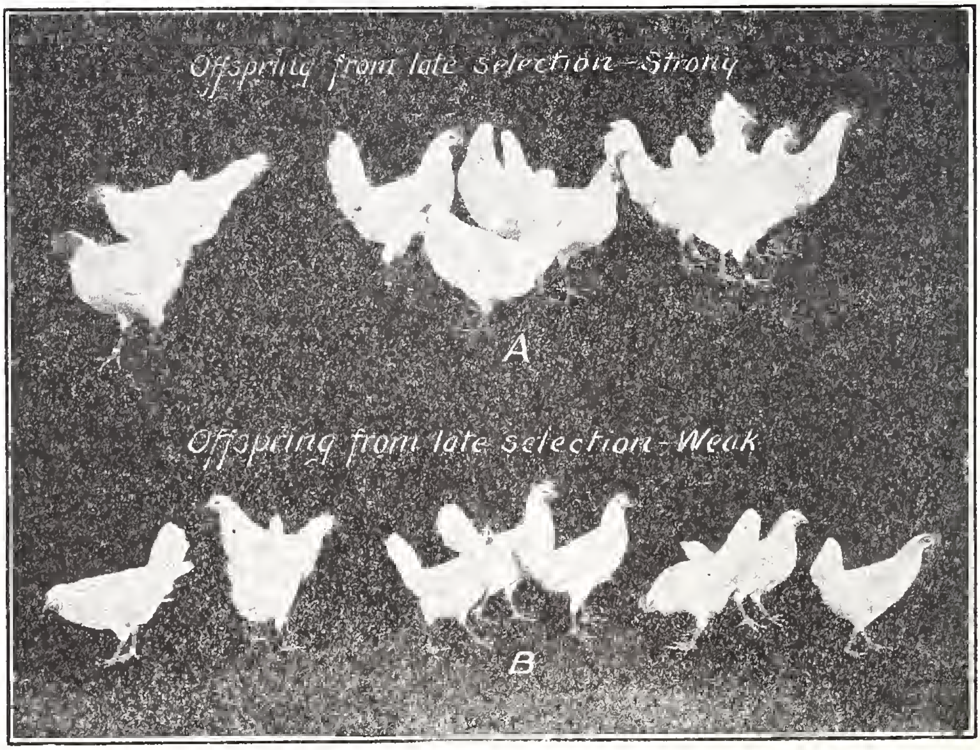

Offspring from late selection—Strong
A
Offspring from late selection—Weak
B

Fig. 5.

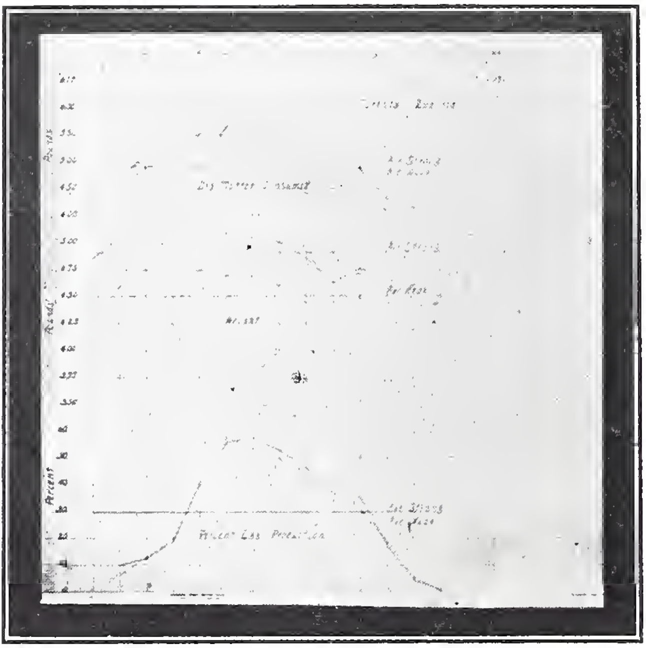

Percent
Percent Egg Production

Fig. 6.

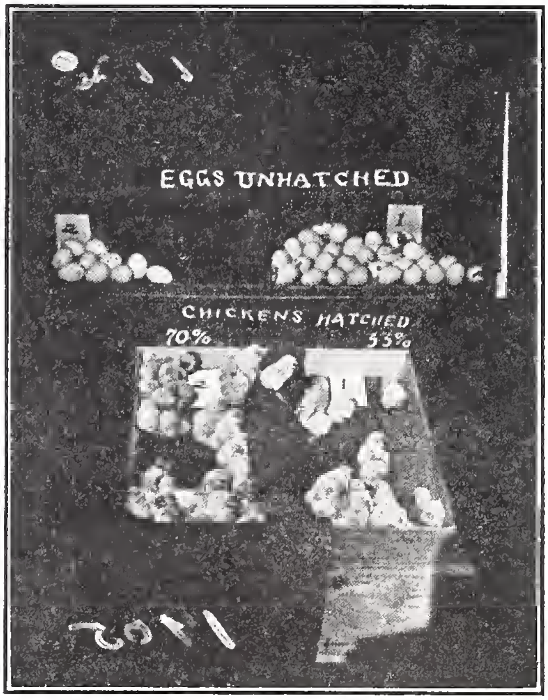

EGGS UNHATCHED
CHICKENS HATCHED
70%
53%

Fig. 7.

them we found that the pullets (Fig. 5 A) that we hatched from the eggs laid by hens of higher vitality weighed one-half a pound apiece on the average more than these pullets (Fig. 5 B) of the same age, hatched the same, in the same incubator and brooder, hatched from eggs laid by the hens of low vitality. It was purely a question of inheritance of high vitality and low vitality and made a great difference in the results in dollars and cents.

Here (Fig. 6) we have something that will illustrate the points better than I have explained them. These verticle lines mark off the different months of the years into 13 periods of 4 weeks each. These lines here mark off the distance, the percentage of egg production by the different flocks, and you will see that the solid line is above the dotted line, the heavy one being for the high vitality and the dotted one for the eggs of low vitality, indicating a marked contrast in production between the two. Notice the difference in weight. The hens of high vitality average higher. Also you will notice that they made a better use of the feed that they consumed for the eggs that they produced. And the same thing is true of pullets that were hatched from the hens of high vitality. You will see the same increases in the second generation as you found in the first in the matter of egg production; the same general difference of weight of the second generation as there was in the first, and the same proportionate gain in favor of the more economical use of the feed; showing that the hens in good health made better use of their food than the others did.

We go now to the other end of the cycle of life, beginning with the difference in characters that would indicate high and low vigor of the breeding stock. Now let us examine the eggs and we will find that we can actually tell the high vitality chicken before it ever gets out of the shell. For example, we took some trap-nested eggs from one of the flocks and incubated them, a certain number from each hen, and separated them out, the high vitality and the low vitality germs on the seventh day of incubation when the little embyro chicks were of the size of a little red spot in the egg; nevertheless the size indicated that there was a difference in vitality at that early stage. These eggs were marked and then incubated and the last few days of incubation were separated. This picture (Fig. 7) represents what we found. Of the eggs that were selected for high vitality at seven days' incubation, 70 per cent. hatched; whereas of those that were selected for low vitality only 32 per cent. hatched; and here (Fig. 7 A) are the strong chickens from the strong vitality eggs and here (Fig. 7 B) the weak chickens from the weak vitality eggs, and above here are the eggs that remain unhatched from those of low vitality and the few of the high vitality; showing again that it pays to make a good selection of eggs having strong germs.

The question getting profit out of hens rests primarily on two factors, the inherited tendency to lay and to live and their power to digest food; and with all due respect to pure breds I want to say right here I would rather have the commonest mongrel fowls if they had constitutional vitality and ability to digest food than the best pure breds in existence that did not have good health or good constitution.

We should make the first selection with the eggs; the second when the chickens hatch. Here (Fig. 8) are a bunch of chickens just dried off, about 36 hours old, and there is one of high vitality; here (A) is another; here (A) is another. You can see by the plumpness of their bodies, the round full eye and the well shaped head and the heavy fat legs that they are well born. You can tell at a glance that these chickens are of high vitality; while this little chicken (B) and this here one (B) are manifestly of low vitality. There is no use keeping that sort of individuals. They will never amount to anything.

Notice (Fig. 9) the same types of chickens that we have here two weeks old. Here (A) you have a large chicken, with strong body, bright eye, the body thick and shanks full; whereas here (B) you get the little puny spindly type of individual that never will amount to anything. Here (Fig. 10) you get a contrast of chickens of the same age, hatched alike, all hatched from the same hen. There is one (A) born constitutionally strong; a violent contrast with this chicken (B) of the same age and reared in the same brooder at the same time. Here is one only partly strong (A). Here is one a little better (A). That over there is an individual growng very much faster than any other chicken in the pen. Whenever a chicken shows low vitality either kill it or, if it appears to be worth anything at all to grow for market, mark it with paint so that by no chance will it get mixed with the others; feed it on sour milk and a finely ground fattening feed until it weighs three-quarters of a pound and sell it alive. Do not let that kind of a chicken live on the farm.

In Fig. 11 you see the most violent contrast imaginable of low vitality. There is a long thin "crow head," shrunken eyes, long thin shanks, long thin nose; a good for nothing individual, born so and cannot help it. You naturally ask why that chicken lacked constitutional vigor. If we stop to ask what the little hen is doing each year I think we will find an answer. The wild jungle fowl lays about nine eggs at a litter and only one or two litters a year. The modern hen is expected to lay 130 to 150 eggs and frequently lays 175 to 200 or more eggs a year. A hen laying about 200 eggs lays five times her own weight in a year; and the laying of the egg is different from the ordinary secretion, such as the secretion of milk. It is reproduction which is vastly more exhaustive process. Dr. Jordan, of the Geneva, N. Y. Experiment Station, has calculated that the hen weighing three and one-half pounds that lays 200 eggs a year, compared with a Jersey cow that gives 7,000 pounds of milk having 4 per cent. butter fat, that little Leghorn hen is consuming two and one-half times more dry matter in a year per pound of live weight than is the Jersey cow. So you see why with the quick growing, heavy powers of digestion, rapid assimilation and reproduction of the domestic fowl that they live short, rapid lives and must have a good constitution to stand up under the strain.

One of the causes of low vitality is want of proper housing. Fowls must be kept in the fresh air. In Fig. 12 is a simple little house for protecting 35 hens, where the chickens live in fresh air practically all the time. Some glass is provided to give protection in cold weather, but the object is to open the cloth window except in storm weather.

Fig. 13 shows a broody coop, a desirable fixture in a hen house. Back of the perch platform is the only portion of the house that is double boarded. The house has a concrete floor and a shed roof.

Fig. 14 shows a covered dust wallow. Here the hens will not be likely to soil or throw out the dust as where it is exposed.

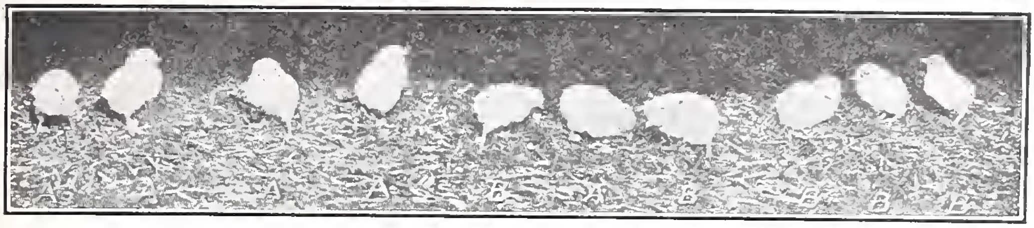


Fig. 8.

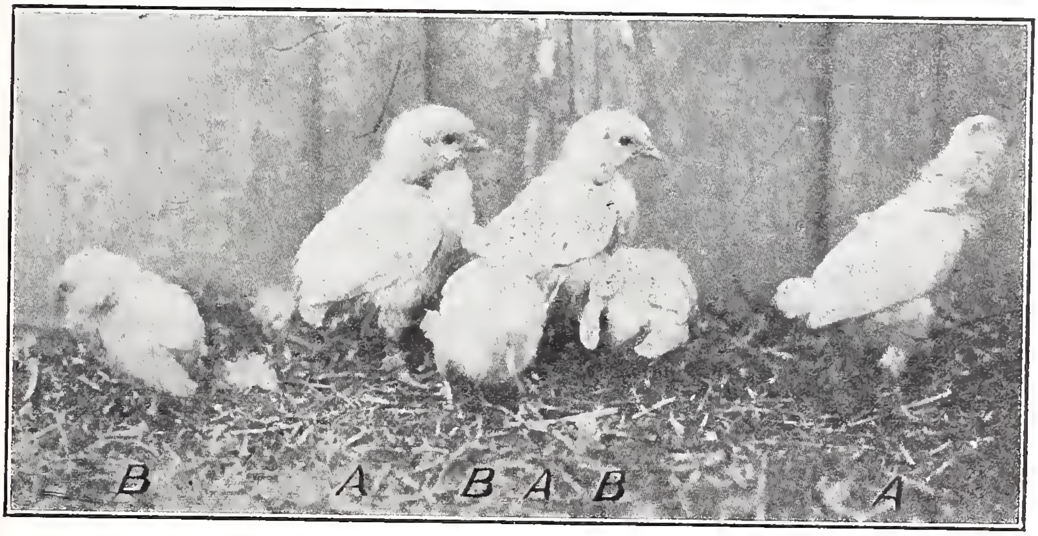


Fig. 9.

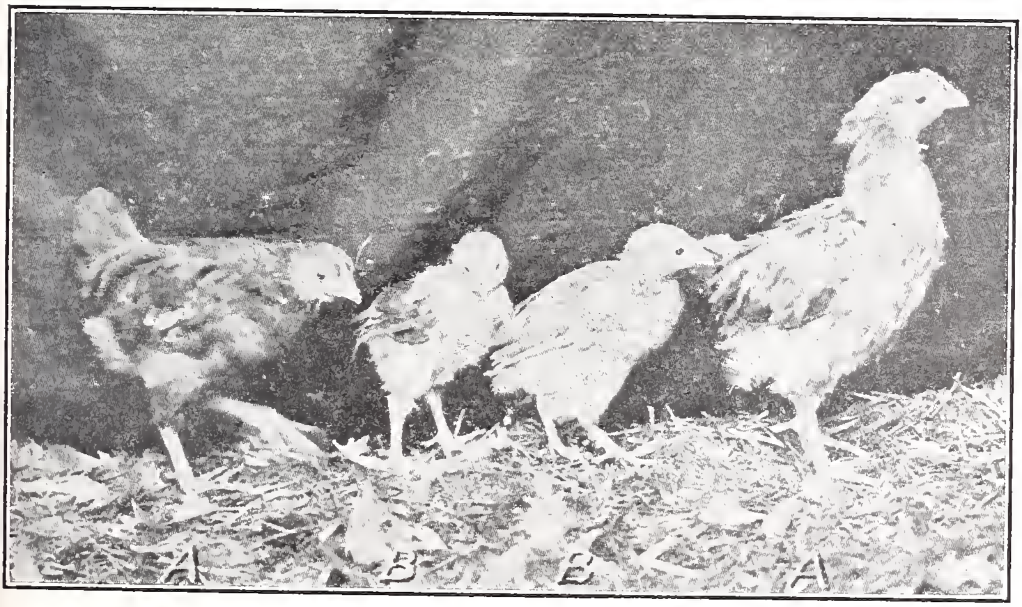


Fig. 10.

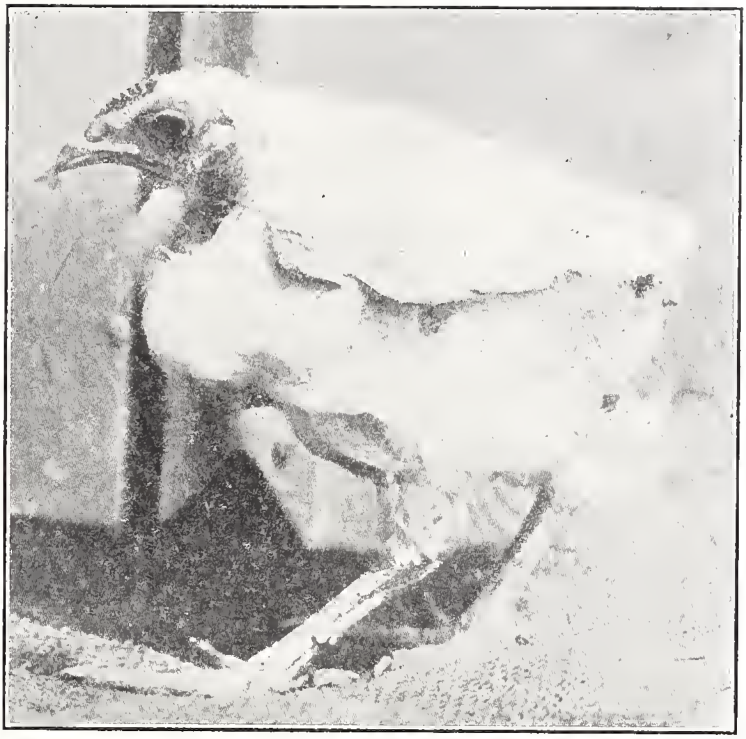


Fig. 11.

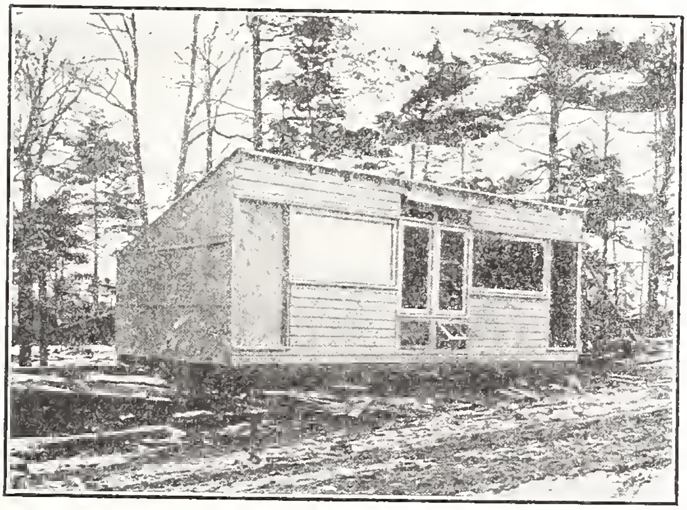


Fig. 12.

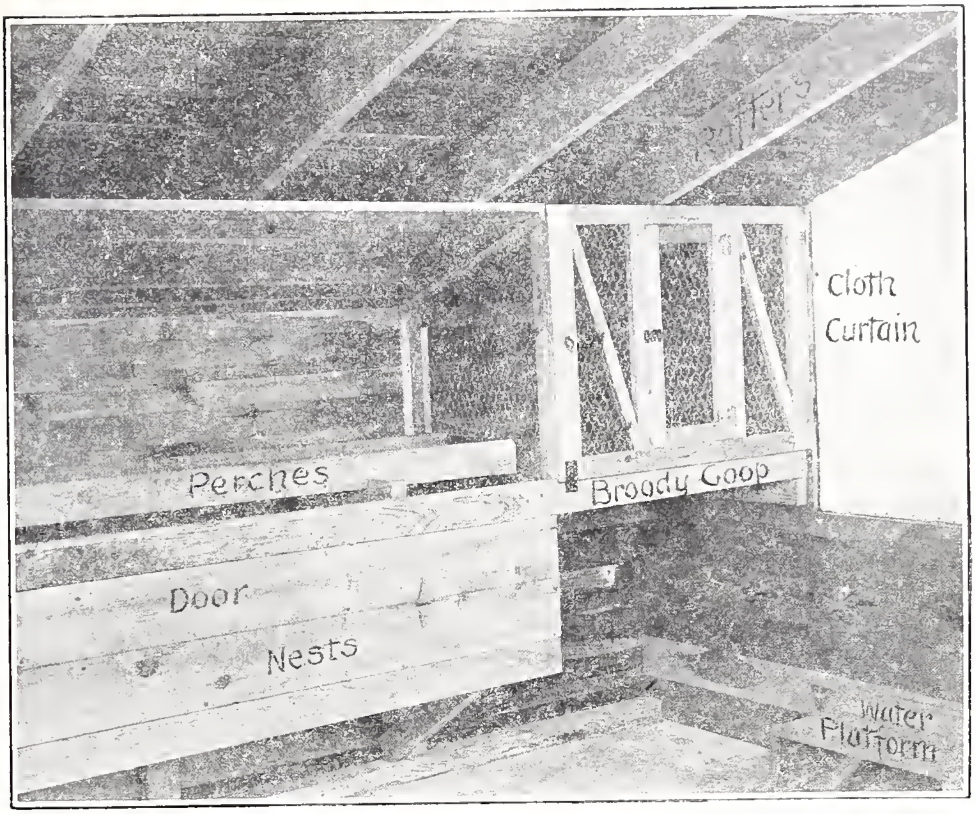

Rafters
Cloth Curtain
Perches
Broody Coop
Door
Nests
Water Platform

Fig. 13.

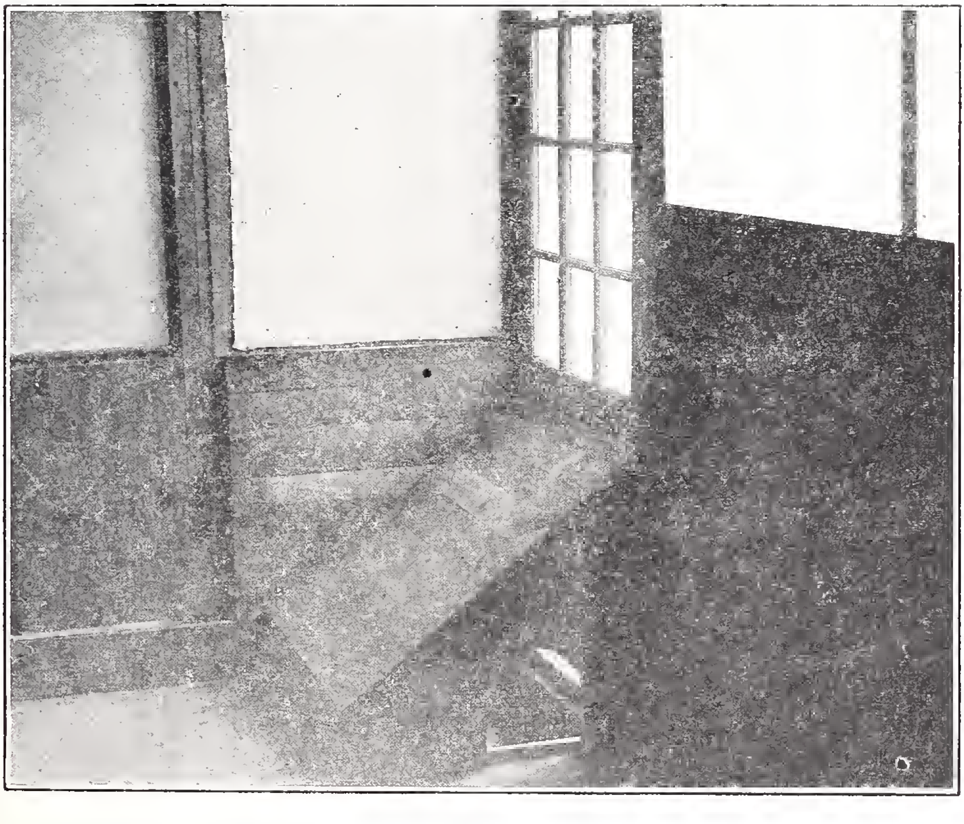


Fig. 14.

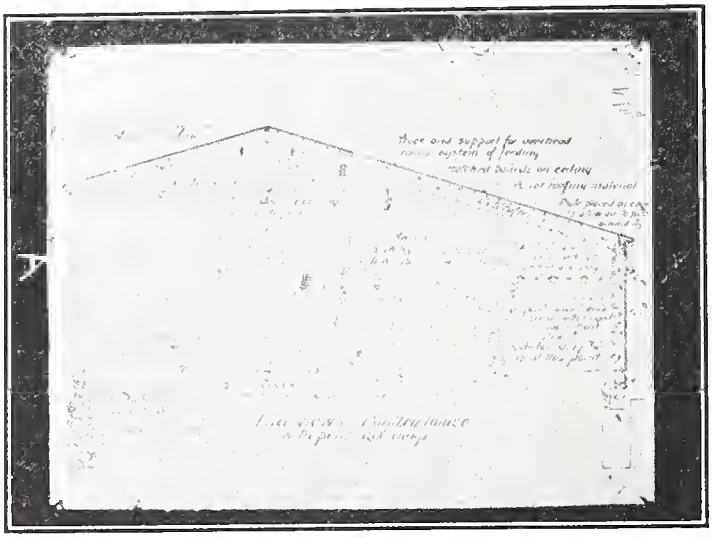


Fig. 15.

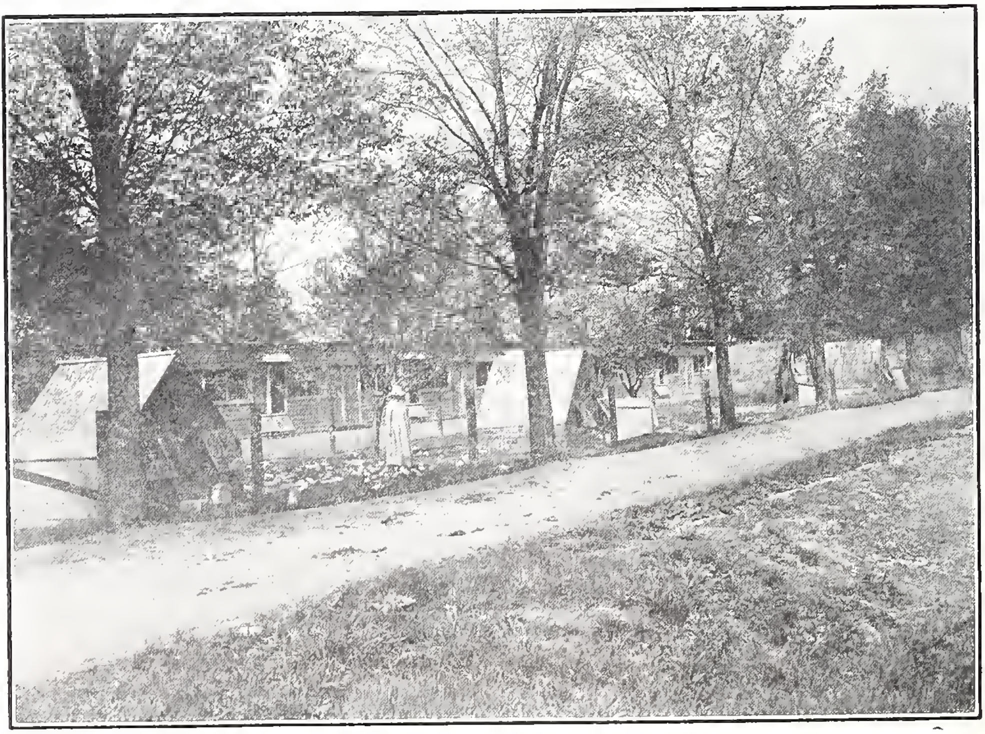


Fig. 16.

Fig. 15 is an end view of the house, showing the construction of the walls. The principle is to avoid a dead air space. We simply let the air circulate through these spaces in the wall between the studding and rafters. The double boarding is open at the bottom and top so that the air can pass up around the space and by so doing prevent this inside boarding from becoming cold and preventing moisture at this point, and the hens are warmer than they would otherwise be. The door on the back and front side of each pen is especially desirable because of the fact that the hens need to keep cool in summer as much as they need to be protected in winter. These doors are kept closed in the winter and when open in the summer allow the air to pass up through and out the front of the house, making this building much cooler in the warm weather than it otherwise would be.

There is one way in which we lose vitality and never suspect it. In fact, I know of no one way in which more trouble is likely to occur and not be suspected than this. In experiments conducted a few years ago at Cornell a bunch of 50 eggs were kept in a living room for 14 days; another bunch of 50 were kept in a cold storage dairy room and another in a room with a furnace. The average temperature in the first instance was 65 degrees; that is, only living room temperature. The other averaged 50 degrees, a temperature that was so cold that when the eggs were placed there we thought it might kill every germ in them. The furnace room was about 80 degrees. They were kept for 14 days and then all put into the incubator, and at the end of 7 days 53 per cent. of those kept in the living room were fertile, 90 per cent. of those kept in cold storage, and only 24 per cent. of those kept in the warm room. The hatching results showed 52 per cent. from those kept in the living room, 76 per cent. from the eggs kept in the dairy room, and no chicks hatched from those kept in the furnace room, indicating that the germ had died because kept in too warm a place.

Following that experiment, here is another one in which all the eggs were kept in the living room at 65 degrees and kept there for various lengths of time, from 1 day to 7, 14, 21, 28 and 35 days, and then all were put into the incubator at the same time, with the following results: Those kept 35 days, 8 per cent. fertile; those kept 28 days, 9 per cent. fertile; from 1 to 14 days, 78 per cent.; 1 day, 86 per cent.; and the hatching results were in essentially the same ratio; that is to say, pretty good percentage of hatching from the eggs kept only a few days, while almost no results for those kept a considerable length of time.

A common notion is that we get vitality by crossing our fowls. We wanted to find out whether this is true or not, therefore we instituted an experiment in which we crossed barred rock males with white leghorns hen and with leghorn males on barred rock hens and compared them with the pure bred rocks and leghorns. The results I can only briefly give to you. They are, that after three years' test in comparing the first crosses and the second crosses with the pure breds of similar ages we find that they have gained absolutely nothing in egg production by either of the crosses over the pure bred leghorn. We have gained nothing in size, and meat qualities of our cross bred chickens over the pure bred rock; but we have lost something by each of the crosses. We have lost because we have neither one nor the other. We have simply undone, by mating these fowls together, what it took some skillful breeders fifty years to accomplish, and we have not increased the vigor or health of the chickens as compared with the pure breds. The pure bred white leghorns of the third generation laid us last year 182 eggs apiece, an average for every pullet in the pen. The barred rocks averaged 129; the crosses averaged just about 133 to 150 apiece. We did get chickens in each of the crosses a little larger than the leghorn by means of the barred rock infusion of blood, but that is all we accomplished and that was not worth while because we had a better individual for meat purposes in the barred rock. Our experience for these pure breds at least, is to not cross them, but to keep the bred pure and get new life and vitality by getting new blood from somebody that has something better than we have ourselves, of the same variety.

One of the ways in which we can economize in the handling of poultry is in rearing the chickens in large numbers. I have here a slide (Fig. 16) that shows the nursery where the chickens are started. This is an excellent colony house 8 feet square. There is a big hover inside the house that will cover 250 to 300 chickens in a single flock. These houses are kept close together early in the spring and after the houses are all filled with the young chickens three or four weeks old, then the houses, chickens and all are moved out on the farm into the corn field or on the meadows where they can have free range. By this method we can reduce at least three-fourths of the labor of rearing chickens in large numbers.

Fig. 17 shows four methods by which these houses are moved. If we want to move the house only a few rods in the same field we just hitch the team to it and draw it along. If we are going to move it across the fields we run it upon a skid. If however the houses must be moved on the highway a mile or two, as we are obliged to do every year with the 25 houses because we have not enough money to build a double equipment on each farm, these houses are put upon wagons and moved out to the farm. It costs about $1.50 apiece for moving the houses so far. The reason why it is necessary to move these houses back and forth to the farm is largely because we use the houses all winter for laying hens. These houses are big enough to hold 12 to 15 hens all winter. We find we can carry over 350 hens each winter more than we otherwise could because we use our brooding system the year round, brooding chickens in the spring and keeping laying hens all the winter.

Fig. 18 shows a closer view of the house. This is a later pattern.

Fig. 19 shows filling a tank with gasoline with a 5 gallon can. The burner under the house burns with a blue flame, and the heater box is made of galvanized iron and is fire proof. The heat pours down on the chickens and the fresh air comes in and spreads out over the chickens.

In Fig. 20 we see several thousand chickens on the range where they are reared. Last year with 4,000 chickens one man did all the work of brooding and handling these chickens. The only time he had help was occasionally for cleaning, once a week when the chickens were young. After that he did not have any help, and the latter part of the year he had time to do other things besides. This is because much of the work is done by horse power and because the chickens are

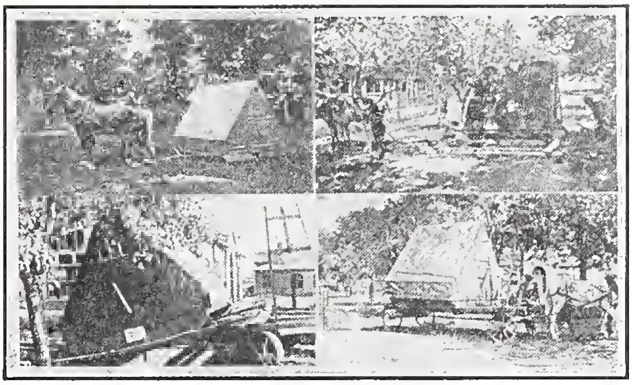


Fig. 17.

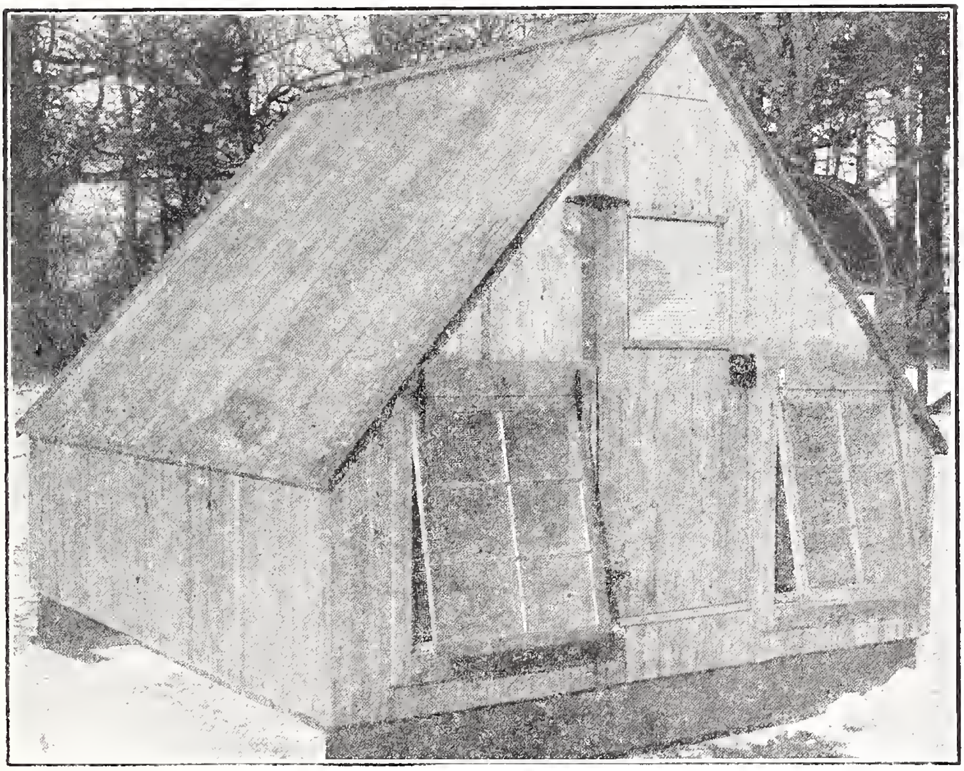


Fig. 18.

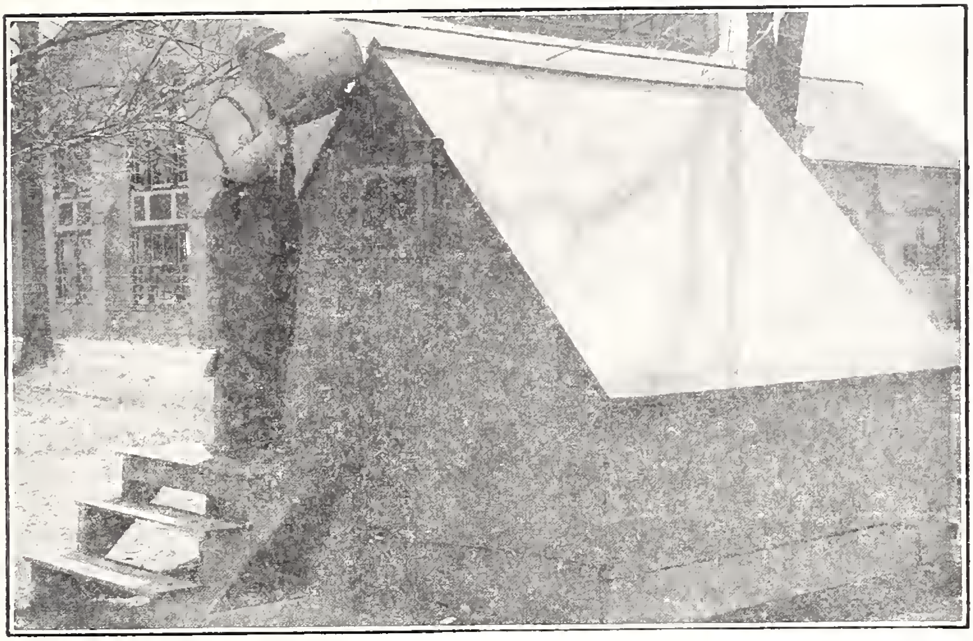


Fig. 19.

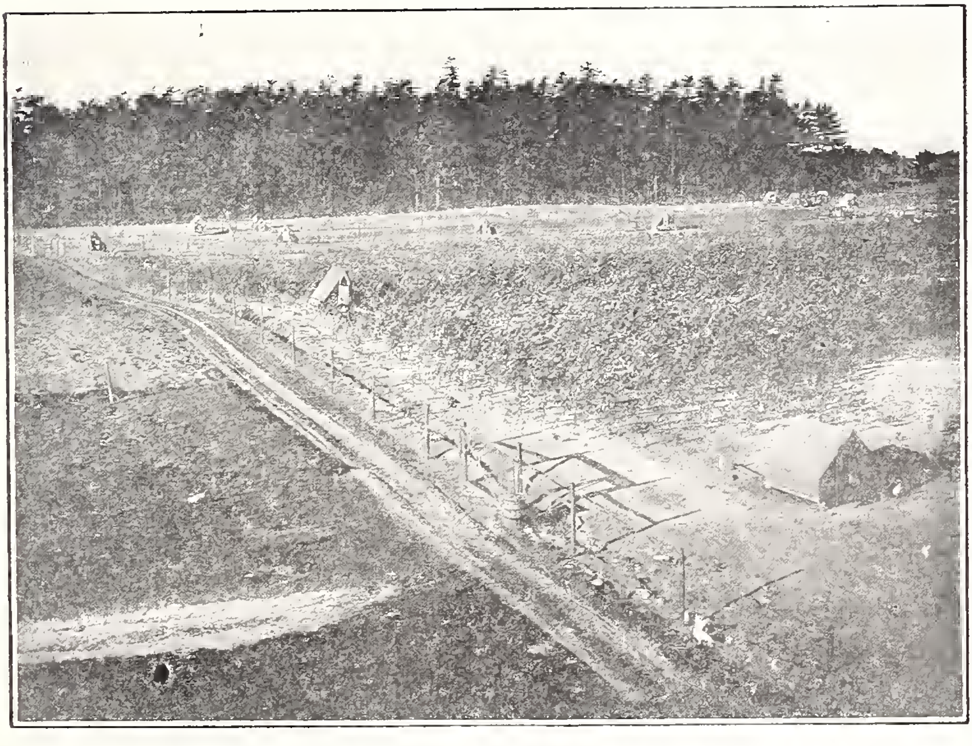


Fig. 20.

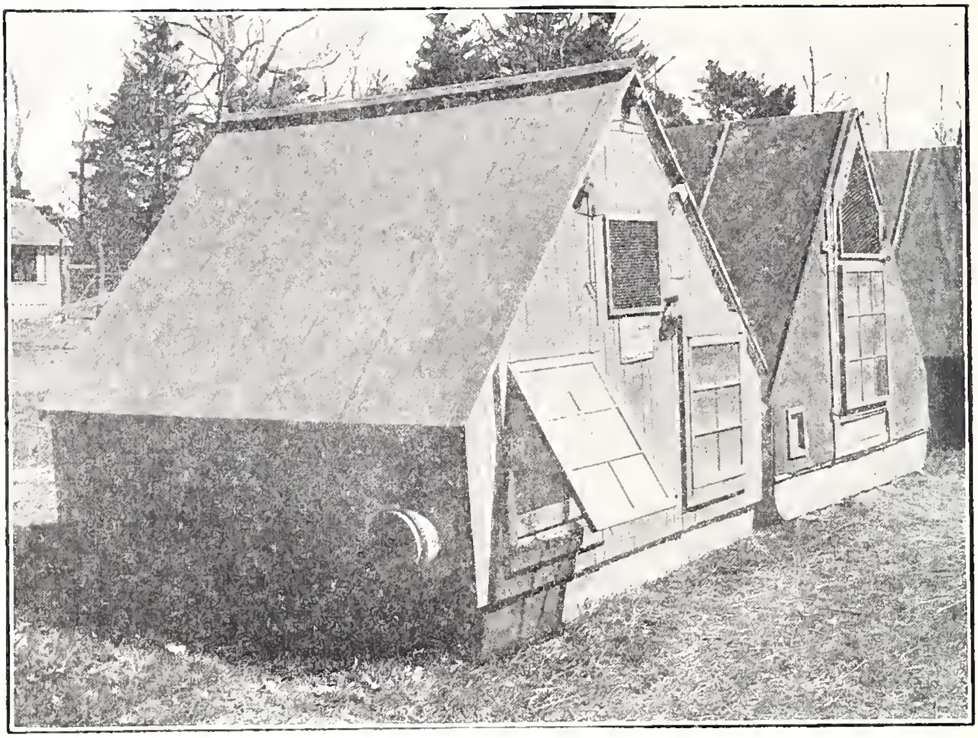


Fig. 21.

Fig 22.

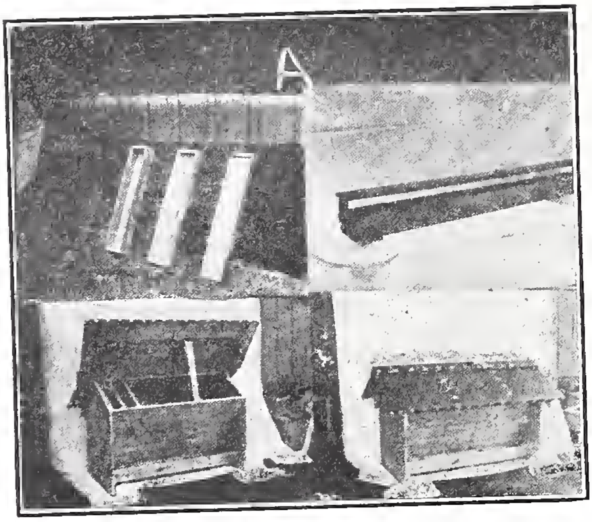


Fig. 23.

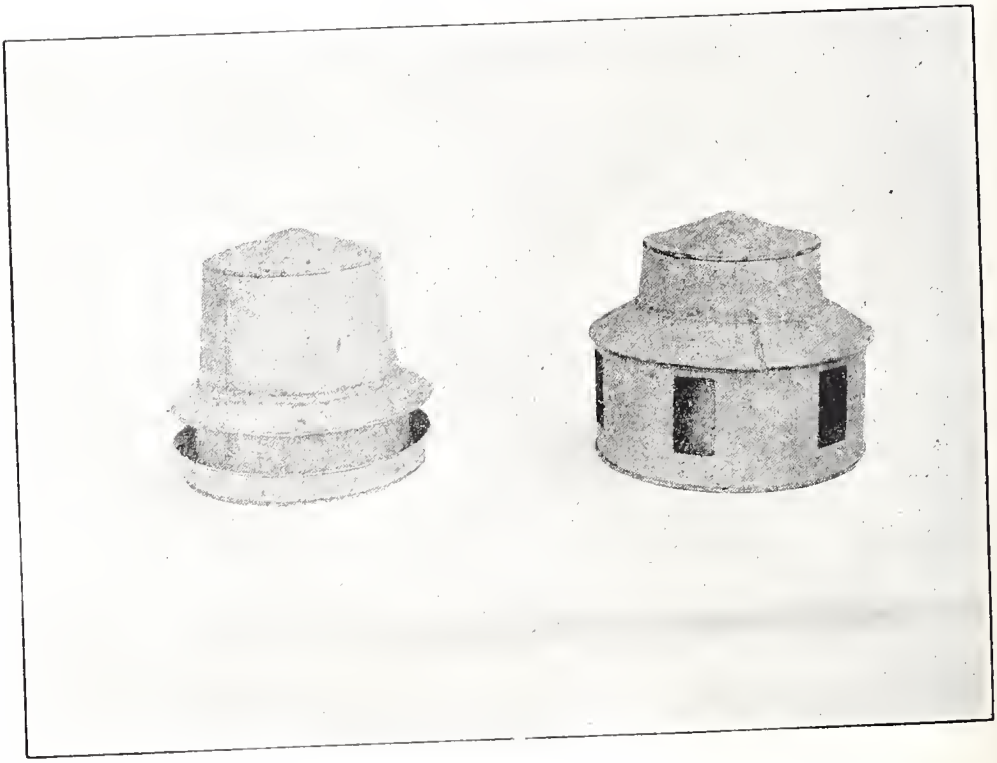


Fig. 24.

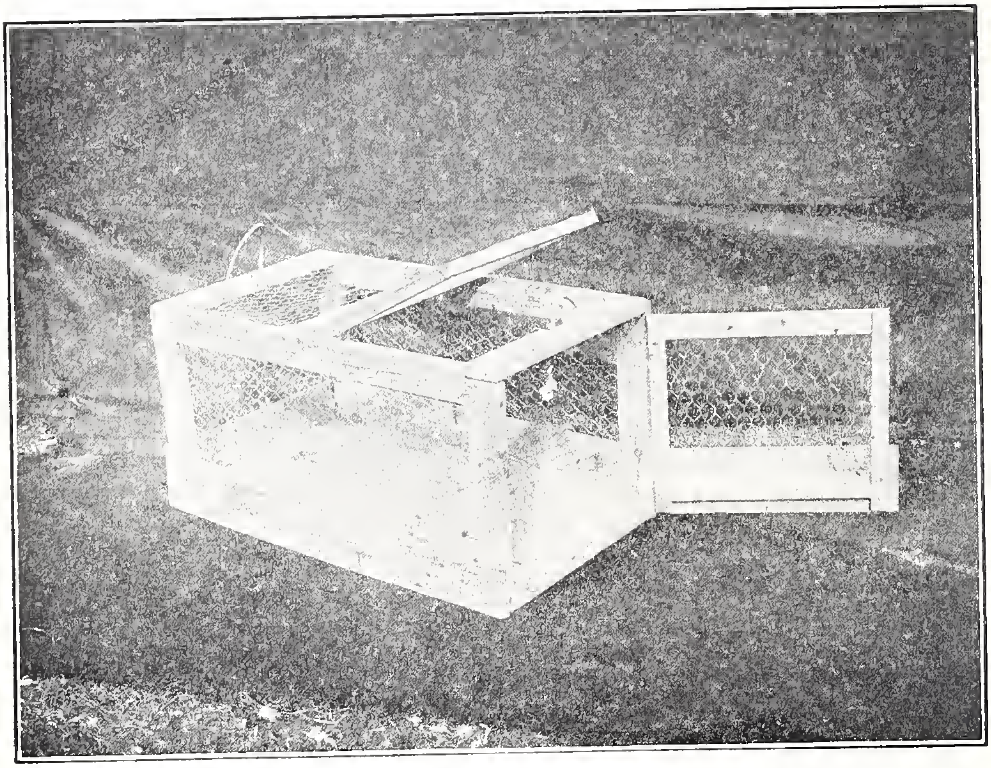


Fig. 25.

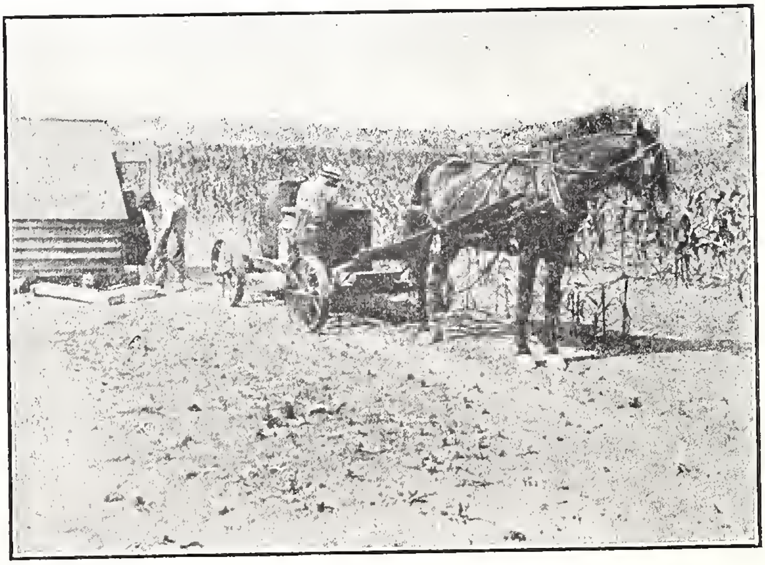


Fig. 26.

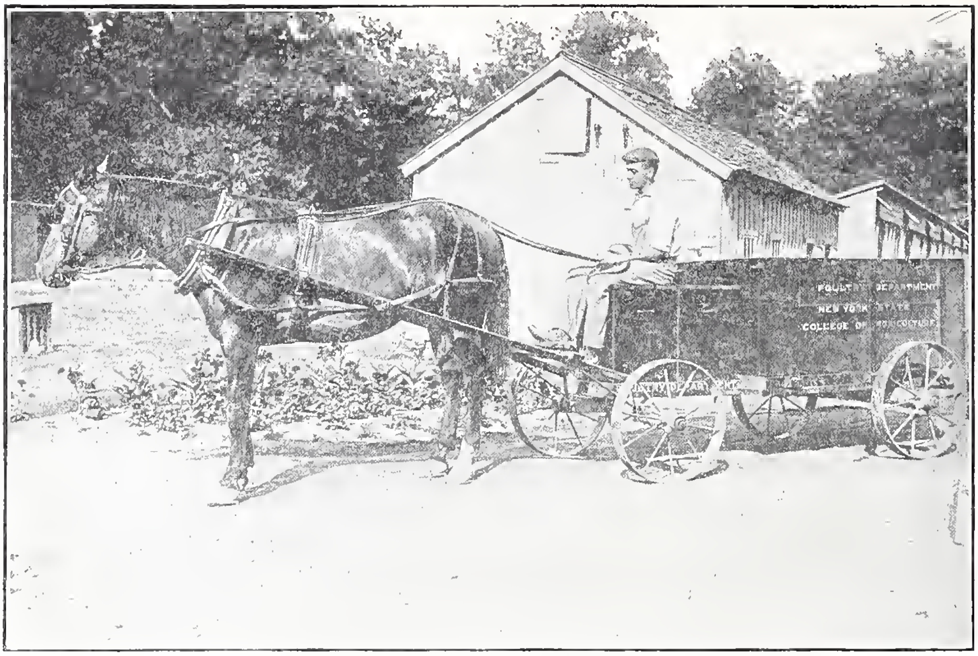


Fig. 27.

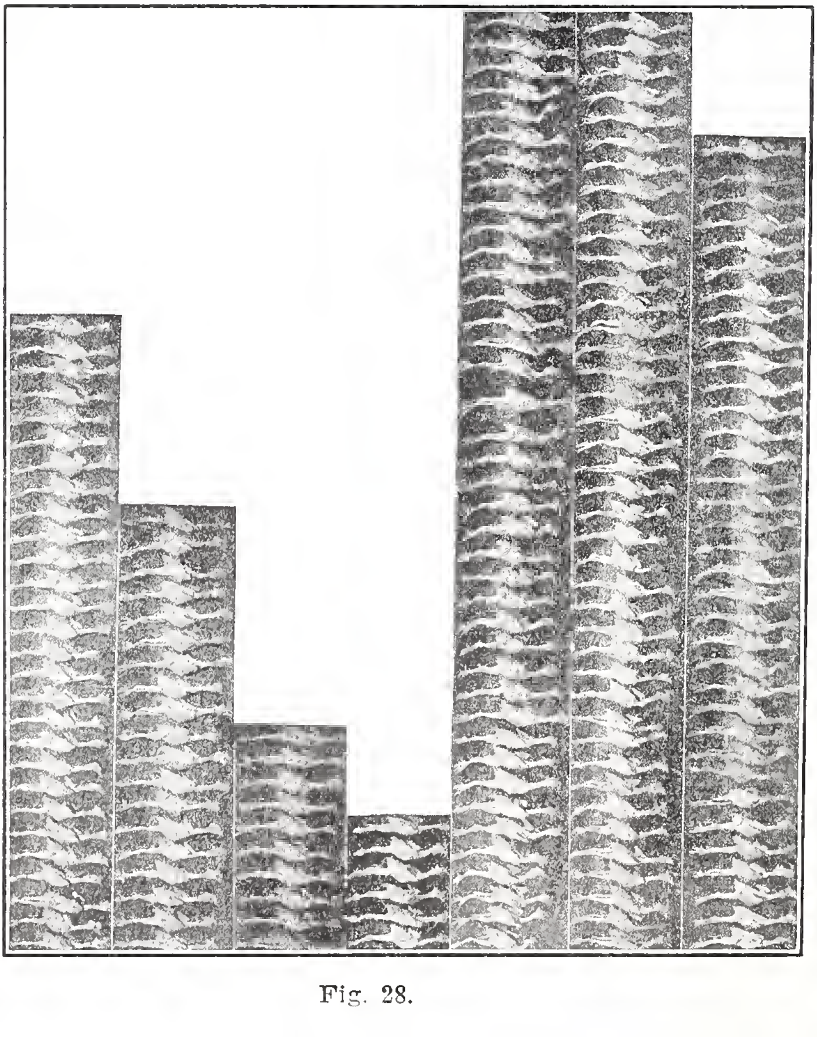


Fig. 28.

kept in large flocks. The houses are 100 to 50 feet apart, and the chickens running together and not fenced to separate except where they are of different ages. The illustration shows how these houses are scattered over 5 to 10 acres of land.

A simple device for connecting up several of the houses for winter use is shown in Fig. 21. You may notice that little galvanized collar at this point. It connects up three houses. The houses in this division have been removed to get photographs. The house in the centre of the group is where all the chickens roost, 45 of them; and this house to the right is where they go to eat, 45 of them; and the house to the left is the house where they go to lay, 45 of them; and then all run back and forward and go visiting when they please. Instead of having to take care of each house with 15 chickens, we take care of and clean only one house, gather the eggs in one and feed in one, a saving of 66 and two-thirds per cent. of the work in caring for the colony of 45 chickens as compared to keeping 15 in each house.

A corn field in which the chickens are running in the rape where the houses are so that the chickens will not destroy the corn as it comes up is shown in Fig. 22. The surplus chickens are removed when about 8 to 10 weeks old. We have about 200 or more chickens in each house when they get old enough to separate the sexes, which makes it desirable to prevent overcrowding.

Four different types of feeding troughs are shown in Fig. 23; one by which the very young chickens are fed; later a higher one; then a higher one still; and then later they are fed in this large one only once a day, and after eight weeks old they are fed in these out door hoppers you see here. After eight weeks old they are all fed by the hoppers by the man driving around and filling them once a week. It becomes an economical method.

Here is a sanitary water fountain (Fig. 24) by which chickens cannot soil their water. It is turned down side up to take the water out and wash it.

Fig. 25 is a catching box that ought to be on every chicken farm. You can drive the chickens in from this end and shut it up; and one man on each side of the box can carry a lot of chickens without danger of their smothering or having frightened them. It is a great labor saver to do this instead of frightening and running the chickens.

The low down wagon used to carry the water barrels is shown in Fig. 26. This is the wagon used to carry the feed, water, milk, &c and make the rounds in caring for the large flocks. To clean out the houses it is arranged as shown in Fig. 27. Two boys can go a mile and do all the work of feeding and watering 2,000 to 3,000 chickens in less than an hour.

In our experiment where we tried seven methods of feeding chickens we found a great difference in growth. You can get the details by sending for our bulletin No. 282. In Fig. 28 you will see the contrast in the size of the chickens and what it will mean if the feeding of chickens is properly done. We fed seven different kinds of rations. At nine weeks we killed all of the chickens that weighed one and one-fourth to one and one-half pounds as broilers and this is the result. You will notice on three rations there were a large number of chickens ready for killing at nine weeks; whereas, on other rations there were only six or seven, and on this ration where they had practically all dry mash only a few more were ready; and where only cracked grain was fed only a few more. Later, at the time of killing, at ten weeks old you will notice these rations have the same proportion of chickens; and then at the final killing, eleven weeks old, almost no chickens were left to be killed from this flock and almost all the chickens or a very large proportion of them remained over to be killed at the end of the experiment. It was a very marked contrast due to the methods of feeding, and all the feeding was done by the same person.

Did you ever see chickens look like those in Fig. 29? Thousands and millions of chickens have been dying of the disease know as the white diarrhea. These chickens are suffering from that disease. Dr. Retgar, of the New Haven, Conn. Experiment Station, has found that this bacillary white diarrhea is a bacterial disease that is carried from one generation to the other through the ovary of the hen and the bacteria is left in the yoke of the egg so that the chicken is doomed to have the disease before hatched. If the chicken survives because it has a weak form of the disease it gives it to the next generation and so carries it on. It has been found also that the little chickens if they are not born with the disease in them may catch it up to the time they are four or five days old from other chickens that had it, but if not so doomed they will get through without trouble.

Fig. 30 shows what must be done as a means of prevention and that is thorough disinfection with 5 per cent. carbolic acid and 5 per cent. sulphuric acid and water 90 per cent. in order to be sure of killing the disease germs existing, and selecting the hens rigidly to find out that we do not have the disease on the place, and generally by keeping the chickens or hens away from where white diarrhea exists.

In Fig. 31 is shown a correllation between the number of eggs a hen will lay, the weight of the hen and amount of food that hen will consume. You will notice as these curves of food consumption drop the weight has gone down and the egg production down. As the feed consumed goes up, the weight goes up and egg production goes up; when the food consumption declines the egg production declines. These curves illustrate the most fundamental thing we know about feeding hens. It is this: that hens to lay well must have all they can eat of the right kind of food; and second, they must have that feed before they begin to lay. I met a man this winter who said his hens were not laying and he was not going to give them anything more to eat until they did. Any poultryman knows, who watches his hens, that they will begin to eat more for two or three weeks before they begin to lay because it takes that long for the eggs to develop; and this proves it. We have examined hundreds of hens and we find the rule holds good, that the hen will first begin increasing in the consumption of food, then increasing in her weight and then she will increase in egg production. The best condition for egg production is when a hen has surplus fat on the body. A poor hen cannot lay. They must have some surplus fat with which to make the first.

The hen shown in Fig. 32 is a good one. We discovered her in a moulting experiment. This hen was the last one of them to moult. She moulted on the 28th of November. She had laid 213 eggs in ten months and was the last hen to moult in a flock of over 200 and the best hen we had. In looking up the egg records of other hens we find that almost invariably the best laying hens we had are the ones that

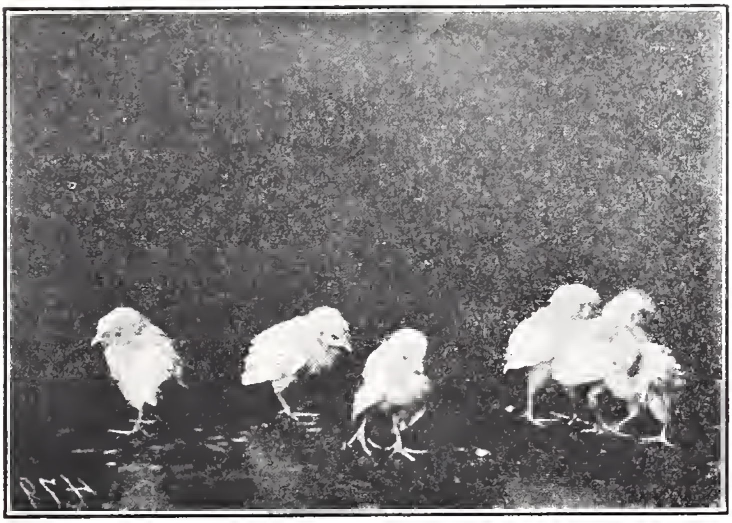


Fig. 29.

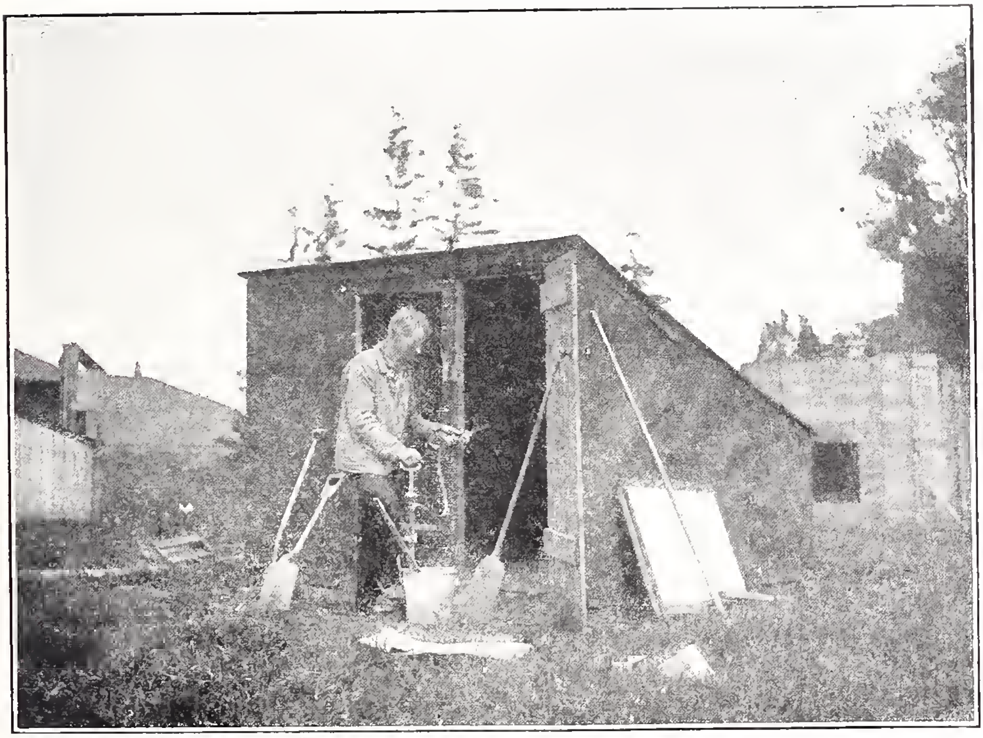


Fig 30

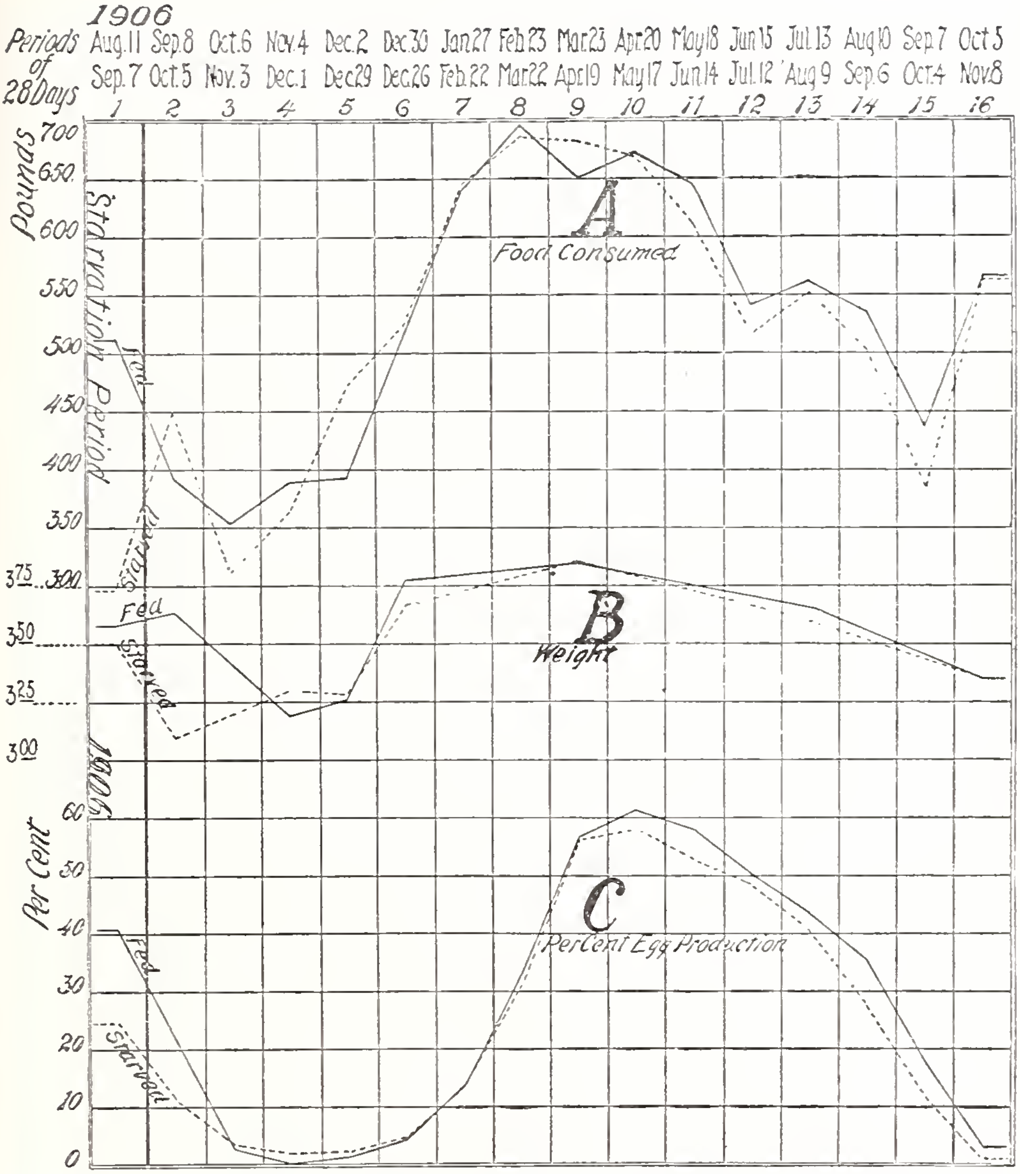


Fig. 31.—A comparison of starved and fed flocks, by periods of 28 days. A=Consumption of food. B=Weights of fowls in pounds. C=Per cent. production of eggs.
Fed flocks—Pens 8 (3 years old), 19 (2 years old) and 24 (1 year old).
Starved flocks—Pen 5 (3 years old), 22 (2 years old) and 25 (1 year old).
Note that the same general observations as to the increase or decrease in the food consumed, weight and percentage egg-production applies in the same manner as observed in Fig. 16.

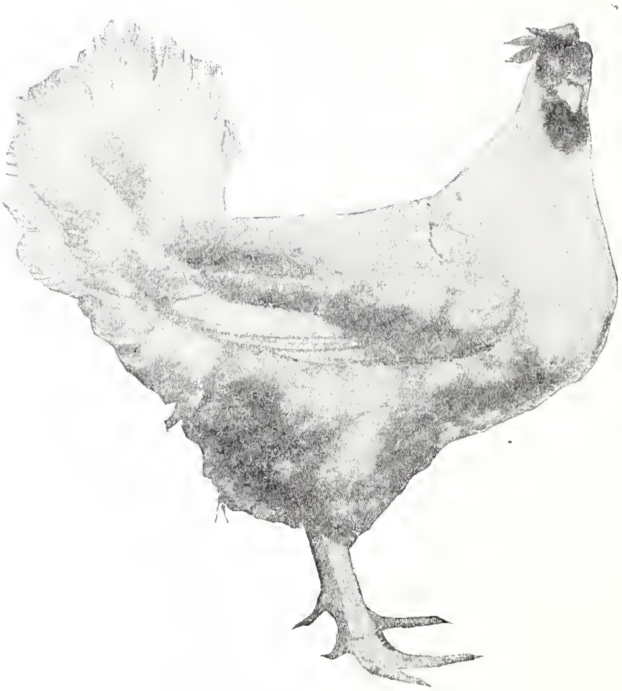


Fig. 32.

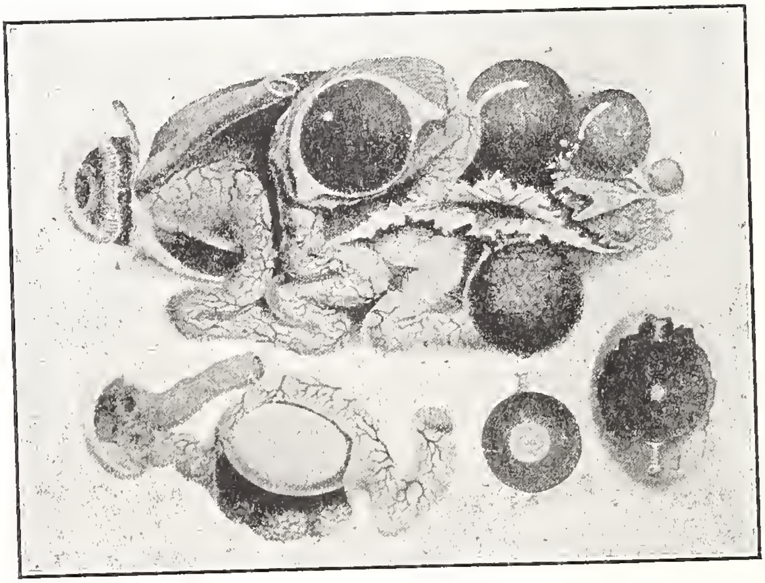


Fig. 33.

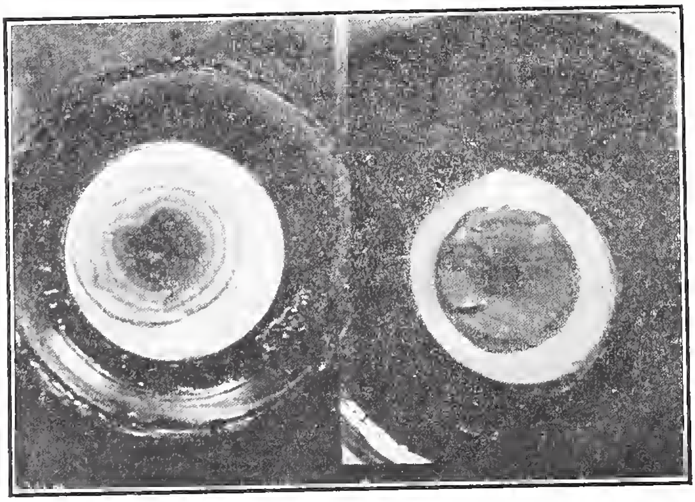


Fig. 34.

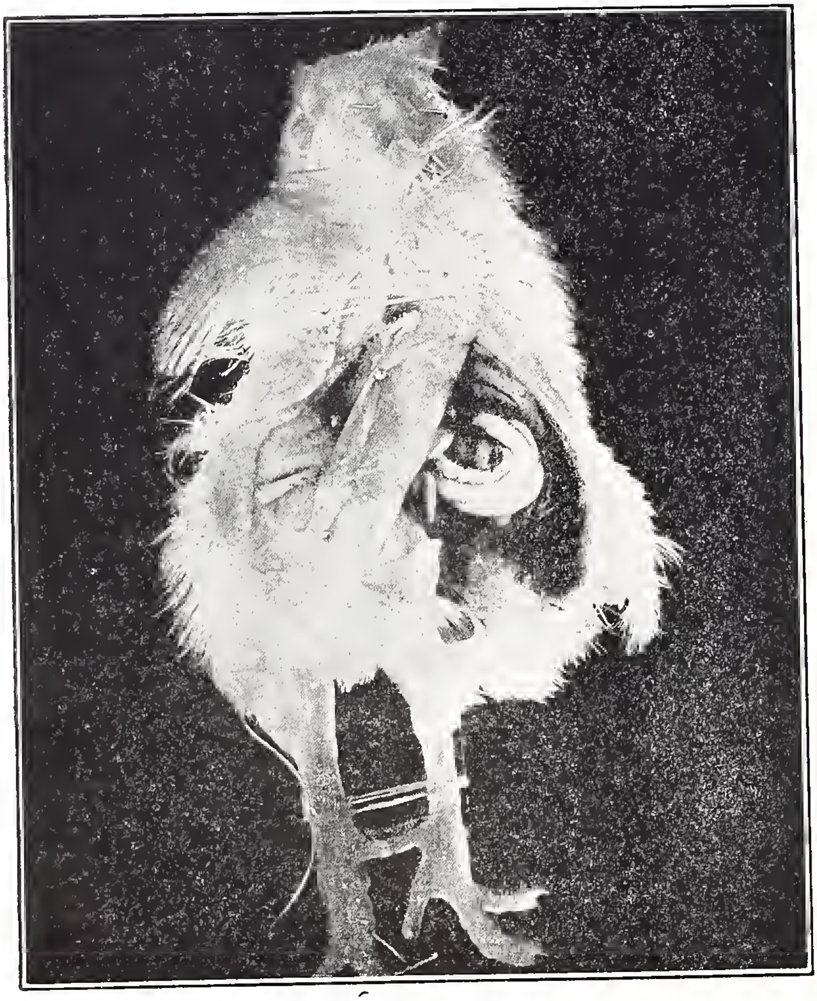
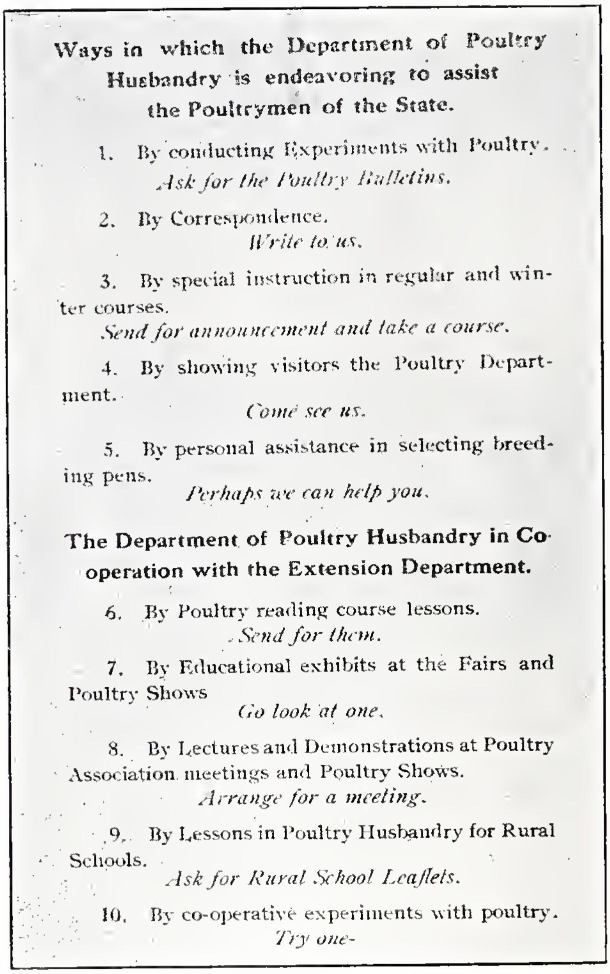


Fig. 35.



Ways in which the Department of Poultry Husbandry is endeavoring to assist the Poultrymen of the State.

1. By conducting Experiments with Poultry.
Ask for the Poultry Bulletins.

2. By Correspondence.
Write to us.

3. By special instruction in regular and winter courses.
Send for announcement and take a course.

4. By showing visitors the Poultry Department.
Come see us.

5. By personal assistance in selecting breeding pens.
Perhaps we can help you.

The Department of Poultry Husbandry in Co-operation with the Extension Department.

6. By Poultry reading course lessons.
Send for them.

7. By Educational exhibits at the Fairs and Poultry Shows
Go look at one.

8. By Lectures and Demonstrations at Poultry Association meetings and Poultry Shows.
Arrange for a meeting.

9. By Lessons in Poultry Husbandry for Rural Schools.
Ask for Rural School Leaflets.

10. By co-operative experiments with poultry.
Try one-

Fig. 36.

moult last, and the poorest layers we had were the ones that moulted first. And here all these years you and I have been killing off every fall the best hens because we have picked out the early moulters because we thought by virtue of early moulting that they would be the best early winter layers. We have found also that not only do the last moulting hens lay most but they also take a shorter time to moult than the hens that moult early.

Fig. 33 is a picture showing the development of the egg, the ovary and oviduct. Right here in the ovary is where the disease of white diarrhea occurs. When the yolk breaks from the follicle and falls into the ovasack and comes down here and passes along where the albumen is deposited, the shell of the egg is laid on. A moment ago I stated the fact that the hen must have surplus fat in her body in order to lay well. This is the proof. The first part of the egg developed is this little yolk in the follicle, and there are many hundreds, 1,500 or more of these contained in the ovary along the spine. 64 per cent. and more of the dry matter in these yolks is fat and unless the hen has surplus fat in her body to develop the ovum, then she cannot lay, so that if we are going to get eggs we must give the hen an abundance of food so that she has the available nutrients to develop the ovum. We must have the right kind of material to manufacture the egg.

In Fig. 34 is shown one of the results of our experiment in which we undertook to find out what place inside of a hen. Governor Hoard says the darkest place in the world is the inside of a cow. I beg to differ with the Governor because just as dark a place is inside the hen.

A red dye due known as Soudan II was mixed with the food and absorbed into the body and in that way the dye affected the egg and here we can count up the red rings on the yolk and tell how many days it took to develop. We find it took ten days to fourteen days to develop from that small ovum up to the full size yolk of the egg. We found that another dye, Rhodamme red, does not affect the color of the fat of the egg but does color the white of the egg; hence we can tell what takes place in both the white and the yolk of the egg. When the egg is incubated and the chicken hatched we find this interesting thing takes place. In Fig. 35 is a picture of a little chicken hatched from an egg where the mother had been fed on Soudan III and you will notice that the chicken has manufactured the fat of the yoke of the egg over into the fat of its own body. That fat is ordinarily found on the inside of the chicken.

The next slide, Fig. 36, shows what can be done by the poultry departments of the agricultural colleges. It shows ten ways of helping the poultrymen of the State by conducting experiments with poultry, through correspondence, by showing the poultry department, by a poultry reading sourse, by educational exhibits, lectures, &c., at fairs, and by lectures and demonstrations at poultry shows, by poultry lessons for rural schools. These and many other things a poultry department in the State Agricultural College can do.

A few slides more, because the time is nearly up, I will throw on the screen to show the way in which this matter can be brought to the attention of the people. Fig. 37 is the lantern slide exhibit holding about 150 lantern slides which we used at the New York State Fair, where the people can stand and look at the slides with the illuminated back and read the inscription under them.

Fig. 38 shows another portion of the same educational exhibit in the same building, in which there are models of poultry houses and appliances and photographs showing the results of experiments with poultry.

Fig. 39 shows a new departure. Swarms of people passed through the exhibit in a large tent at the State Fair. This was to find out whether or not the people were interested enough in poultry to witness the demonstrations when there was horse racing and balloon ascensions and all sorts of other things going on around. And yet those who were there certified to the fact that every one of the four demonstrations held each day the seats were almost always occupied and many times the attendance filled the tent standing room. So that it was a pronounced success and shows that the people of the country are hungry and thirsty for knowledge regarding the methods of handling poultry.

Fig. 40 gives a view inside the tent showing the assistant giving a demonstration how to kill and pick poultry.

There was also shown an egg grading device by which eggs can be graded and which also shows what the value of these eggs are if they are produced of the right quality. There are 30 dozen eggs there to be put into nine grades, large, medium and small, and each of these groups divided into three grades as to color, white, brown and mixed. The average prices given by the best dealers in New York for each grade of eggs, and the value of the eggs according to the grades is shown. We can tell exactly and quickly what any case of eggs is worth. We find a difference in the New York City market usually of five to twelve cents a dozen between the pure white eggs and the mixed colored eggs of the same weight, and sometimes a difference of twenty cents or more between eggs of the fancy large white and the common or small eggs. It pays to produce the right kind of eggs. I am certain that we know how to produce eggs of better quality and also how to breed hens to produce more eggs. There are a few things we can do in selecting hens to produce more eggs. There a few things we can do in selecting hens for breeders to increase egg production. (1) Select our hens for constitutional vigor. (2) Take hens that moult late because they are the ones that are generally the heaviest producers. (3) Watch the pullets of the same age and see which ones begin to lay first and they usually are found to be the hens that in the long run will lay the largest number of eggs. (4) The color of a fowl's shanks may indicate her laying capacity. The hens in the fall of the year just before they begin to moult that have pale shanks are likely to be heavy layers. We find that it is almost invariably the case with the yellow shank breeds that if you find a fowl with good color in the shanks she is not a good layer. (5) In addition to that we may consider the body of the fowl as indicating prolificacy. There is such a thing as the egg type when you once come to know it, but it is not a certain indication.

Before closing this lecture I ought to bring to your attention the fact that the amount of money that is being spent by the agricultural colleges for dairying and horticulture, and other branches of agriculture, is entirely out of proportion to the amount of money given to poultry. This chart (Fig. 41) shows the result of a census taken by the American Poultry Association to learn the amount of money spent

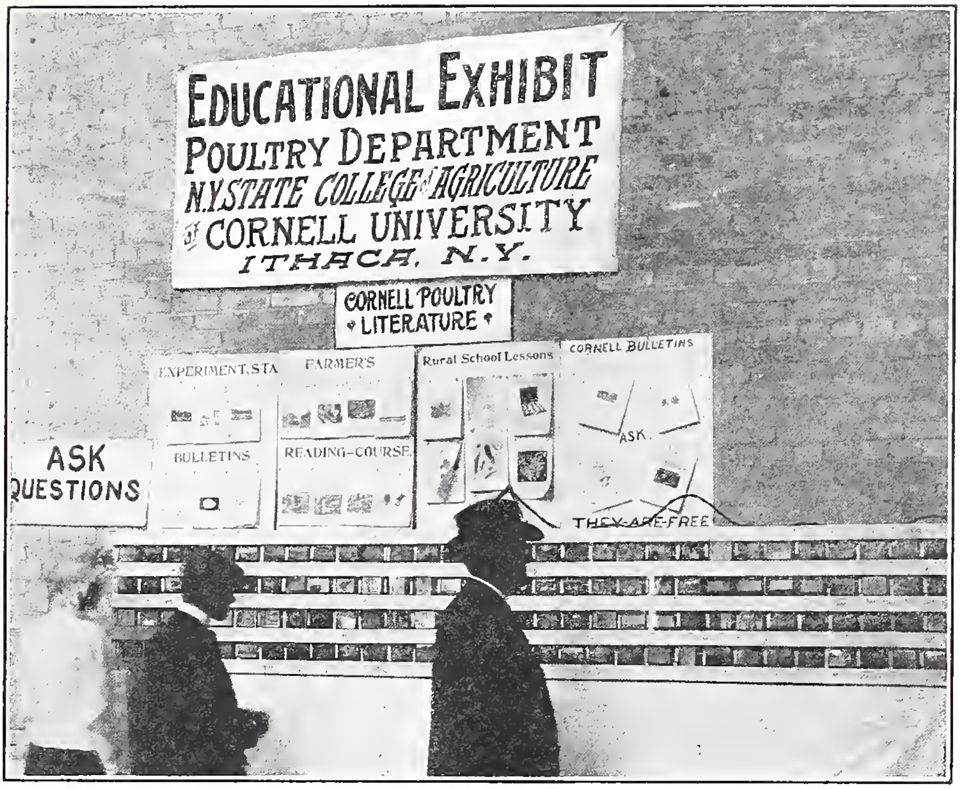

EDUCATIONAL EXHIBIT
POULTRY DEPARTMENT
N.Y. STATE COLLEGE of AGRICULTURE
of CORNELL UNIVERSITY
ITHACA, N.Y.
CORNELL POULTRY LITERATURE
EXPERIMENT, STA
BULLETINS
FARMER'S
READING-COURSE
Rural School Lessons
CORNELL BULLETINS
ASK
THEY-ARE-FREE
ASK QUESTIONS

Fig. 37.

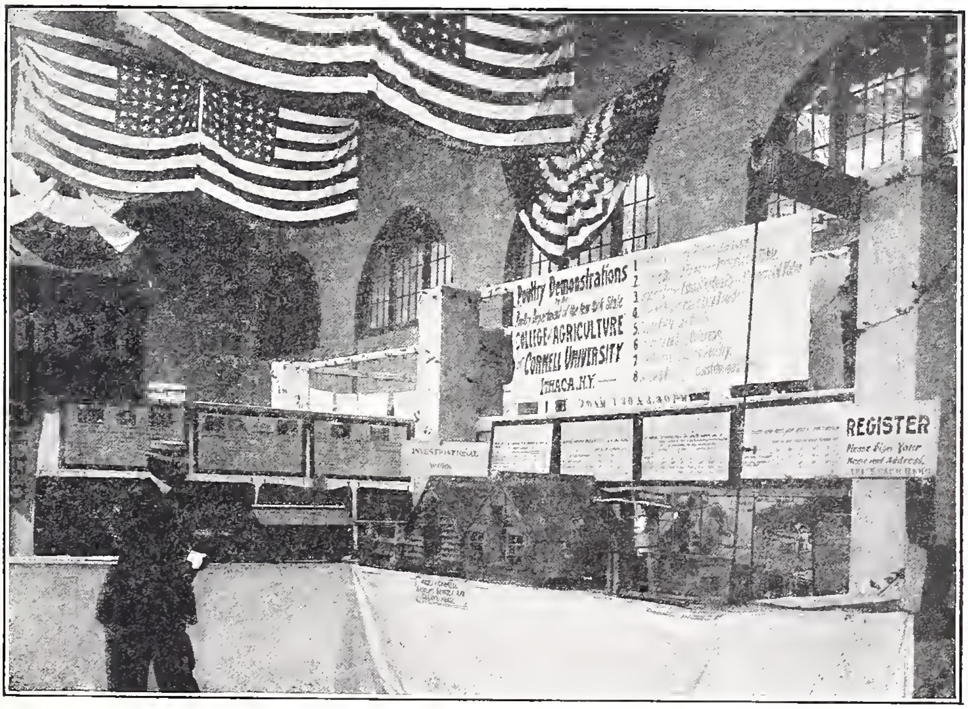

Poultry Demonstrations
COLLEGE of AGRICULTURE
of CORNELL UNIVERSITY
ITHACA, N.Y.
INVESTIGATIONAL WORK
REGISTER
Please Sign Your Name and Address

Fig. 38.

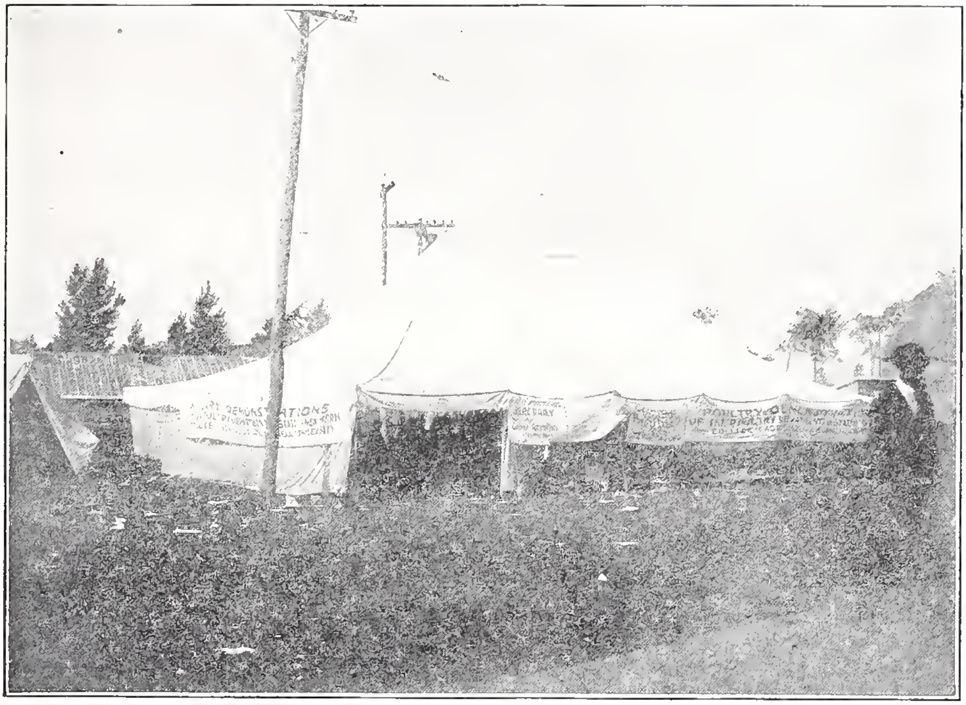


Fig. 39.

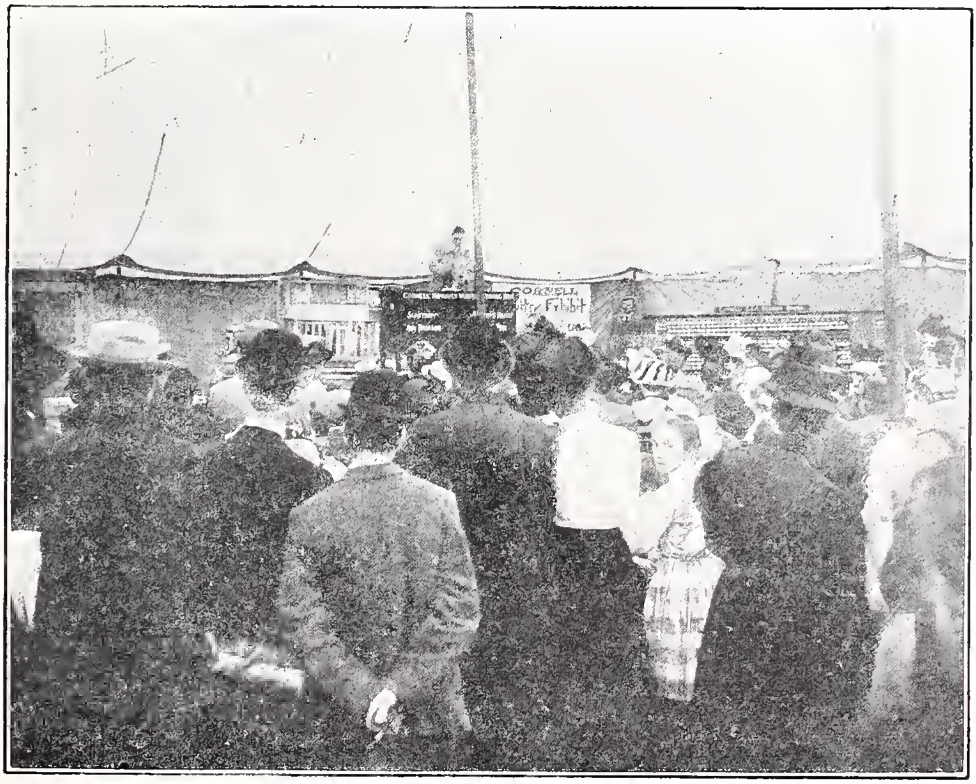
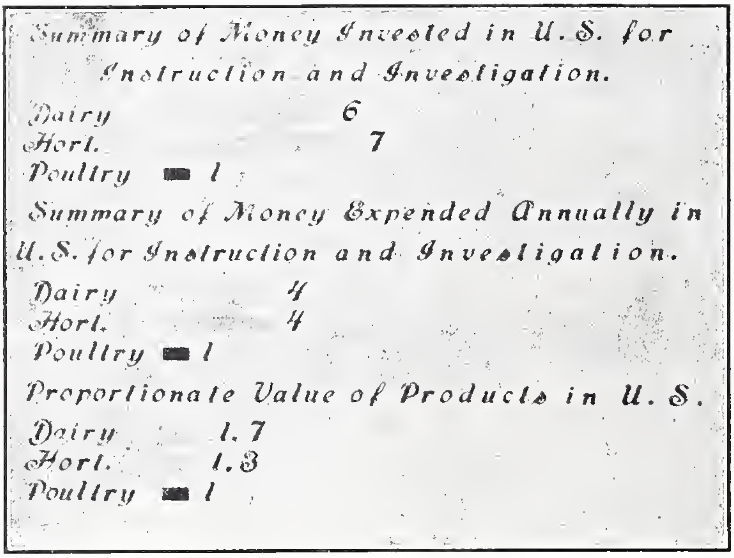


Fig. 40.



Summary of Money Invested in U. S. for Instruction and Investigation.

Dairy	6
Hort.	7
Poultry ▬	1

Summary of Money Expended Annually in U. S. for Instruction and Investigation.

Dairy	4
Hort.	4
Poultry ▬	1

Proportionate Value of Products in U. S.

Dairy	1.7
Hort.	1.3
Poultry ▬	1

Fig. 41.

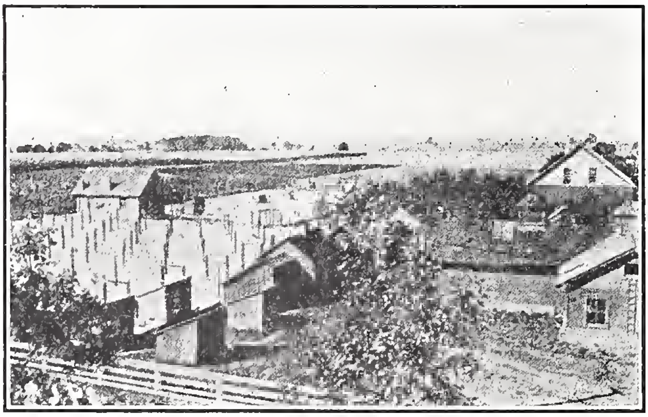


Fig. 42.

for dairying, horticulture and poultry in the agricultural colleges and experiment stations in Canada and the United States. You will notice that for every dollar spent for instruction and investigation and permanent investment in poultry husbandry in the United States and Canada there are six dollars spent for dairying and seven dollars spent for horticulture; and of all this amount of money that is expended annually for every one dollar for poultry there are four dollars for dairying and four dollars for horticulture. However, when you come to get the actual proportionate value of the products produced by poultry, by horticulture and dairying, and by horticulture, according to the census of ten years ago, we find that for every one dollar in value of poultry products produced there are only one and three-tenths dollars in horticulture and one and seven-tenths of a dollar in dairying.

The last slide (Fig. 42) shows a picture in your own State. There is a picture of the poultry department of your own State College of Agriculture, a department where under Prof. Homer Jackson good work is being done with facilities that are wholly inadequate to the poultry interests of this great State. Dean Hunt, I know personally, is thoroughly interested in the development of that department. When I was there a number of years ago he said: "Whenever we can get the appropriation to build the buildings and find the man"—he did not have Jackson then—"to take care of this department as it ought to be, there are twenty acres of as nice land as can be found in the State of Pennsylvania that will be turned over to the use of the poultry department."

The slides show views of the boys in the winter courses making chicken coops, building colony houses, judging poultry and other pictures to show the dozens of ways in which they are trying to teach the latest and best methods that will help the poultry of the State.

I feel that in this great State of Pennsylvania, which is one of the richest and one of the best agricultural States in the Union, and in which poultry husbandry is one of the chief agricultural resources, with the ability and the courage and the loyalty of the poultrymen of the State and the efforts of your poultry association through the able leadership of the President, Mr. W. Theodore Wittman, who is chairman of this meeting, with the assistance of the State Board of Agriculture and Farmers' Institutes and all these other educational agencies, that the State of Pennsylvania is not going to take a position in the rear rank, but is going to measure up to the responsibility and take the position and place it should occupy in the front rank of the states. (Applause).

The CHAIRMAN: If the members or anybody desires to ask Prof. Rice any questions, now is the time?

A Member: We have trouble with gapes in chickens. How can we avoid it and is there any cure? Will spraying the ground prevent it?

PROF. RICE: No; I think not satisfactorily. The best thing that I have found is turpentine administered to the throat wind pipe with a soft feather. That will loosen some of them. But the killing of the parasite in the ground by spraying is not likely to be effective and economical. The free use of lime, cultivation of the soil, will help. The little parasite lives in the soil and in worms in the soil from generation to generation, especially upon the clay soils rather than the sandy soils. The only thing to do is to try to rear the chickens on new land. I don't know a thing can be done more easily than to change the habit of having the chickens reared on the same land each year. They should be moved to some other place every year not only to get rid of the gapes but all other infection. Our chicken houses are moved every spring seventy-five feet or more from the spot where they were before. It does not take much time and saves a lot of trouble and loss.

A Member: We have many railroad men in our community, along the main line of the Pennsylvania Railroad, that only have small lots and they can not go out into the field. Is there anything to spray the ground with that will destroy the mites in the soil?

PROF. RICE: Personally I have never sprayed the ground or undertook to eradicate with anything other than lime. I think the spray would have to go in deep in order to kill all the parasites and of course that would kill the grass. That is a pretty drastic measure but I suspect that something of that kind can be done, though I would think it would be very dangerous business to apply anything that strong to the ground and allow the chicks to run on it. I know of a man who sprayed the soil with "sheep dip," but I cannot vouch for the results.

A Member: What is the cause of the eggs sticking in the hen's body so she can't lay?

PROF. RICE: The hen does not have any power over the development of the egg. She can hold the egg for several days after it is developed and the shell is on; but if anything happens by rough usage or the shell is crushed and she cannot deposit it or if she catches cold or is improperly fed that may cause a drying up of the secretions. There are a lot of things that can happen that may stop secretions so that the egg is held there and she cannot lay it. Other eggs will come down and develop. I found a hen that when I cut her open showed that seven eggs had come down and had been forced into one solid mass in the abdomen. When you see a hen affected that way—you can tell it by the way she stands and strains—simply use some sweet oil and very carefully relieve the hen. Very often you will find hens shaking with convulsions or paralyzed in every muscle, even to the extent of fainting away so one would think they were dead, when nothing is the matter except that the egg is too large or the secretions are dried up, and the egg being pressed against the organs of locomotion the hen is paralyzed for the time. Use a little sweet oil and the egg will be laid and the hen will be all right. It is a case of being on the spot and attending to these little things immediately that often makes the difference between success and failure. Then hen's temperature normally is 105 degrees to 106 degrees and you can see that a fever heat several degrees higher could easily cause congestion and cooks the eggs.

A Member: What is the cause of chickens all at once just dropping over dead, especially young chickens?

PROF. RICE: I don't know. It is pretty hard to be sure of what the trouble would be. I should suspect there might be a case of "heart failure." That is always a safe guess when you don't know. Certain kinds of poisoning act quickly.

A Member: Not poison. Now and then a heavy young chicken possibly three-fourths grown and often when grown drops over dead?

PROF. RICE: I do not know what the trouble would be.

MR. BARNITZ: Give us your opinion on the intensive systems as applied to the farmer, as to whether it would pay?

PROF. RICE: Well now, I will tell you. I want to be as square to any system as I can. I know there are some persons that are succeeding with the intensive method and know them personally. To the person who has only a small amount of land I say make the best use of what you have if you can take the time to give attention and see that the principles of the cold brooder congested methods are carried out to the letter; that is to say, that you have the right proportion of chickens within a given space, to keep the heat in and are careful in feeding, and adapt these to the changes in the weather which occur through the hatching season, you may rear good chickens. But my experience is that it takes too much time and detail, labor and personal attention with so many small individuals, and the difficulty and responsibility involved when many chickens are reared you can see readily that the number of hens or chickens that any one can take care of is limited. The tendency of modern poultry husbandry is to get away from details and little flocks. I know perfectly well that if a person wants to get the largest egg yield possible from a given number of hens that if he keeps them in flocks of five or six he will be more likely to get maximum results than if he keeps them in flocks of 100 or more. It is a question whether you should not try to make a little sacrifice in the rate of production for the sake of keeping more hens and doing more business, which in the end may mean large gross profits. I know that in our own case this last year, keeping our hens in flocks of from 12 to 40 we find that we are getting just as good results in bigger flocks as smaller. The results have been exceptionally good. We have one hen this last year that laid 258 eggs and another 253. The best 15 hens we have averaged 236; and one flock has laid 182 apiece.

A Member: What breed were they?

PROF. RICE: These happen to be white leghorns. We keep mostly white leghorns because the New York market calls for the white egg.

A Member: How long do you keep good layers before you kill them.

PROF. RICE: My opinion is that it is a crime to kill a hen that lays 200 eggs the first year or anywhere near that . I wish I had about thirty minutes to talk along this line. We have been asking more of the modern hen than she can stand and as a result we have all sorts of digestive troubles and breaking down of the constitution; hence the importance to-day to grow a strong hen that will stand up under reasonable production for two to three years, not simply to lay a lot of eggs the first year and die in her next. It is a good thing to be well born whether a hen or a human, and the hen has just as much right to be well born as a human. Hens are more reliable for breeding than pullets. They never lay as many eggs early in the winter as do the pullets. They are then fresh and strong and also give larger eggs. We know that big eggs give big chickens and so have that much start on the next generation. If you are shutting your hens up in the fall of the year and keeping them there all the winter through on the theory that because they are shut up they are off the snow and therefore necessarily give better results, you are making a mistake. Two years ago we tried an experiment. We started to find out what the effect would be on retarding our hens for breeders by letting them run out all winter long as compared to their sisters that are kept shut up. What do you expect we found? Instead of their laying less eggs they averaged fifteen to seventeen eggs apiece more than the hens that were shut up, and they were feed just alike by the same person. We have repeated that experiment this year with the same results.

MR. WITTMAN: How do you know how many eggs these hens lay?

PROF. RICE: We have 25 pens of trap-nested hens. We have been trap-nesting for several years. Complete records are kept every day and figured up at the end of the week. I have right in my pocket the data for all of these pens. We must have records to show what happened to chickens and eggs three or four generations back if we are to secure data that is worth while.

A Member: Is that worth while?

PROF. RICE: You never can get at the roots of things until you get the facts down in black and white. We have been guessing at things too long in the chicken business.

A Member: Could a farmer have the trap-nests?

PROF. RICE: No sir; it costs over 50c per year per hen just to keep the records. It is worth while for the experiment station. That is the business of the experiment station. It is infinitely cheaper for the State to hire a few men to find these things out than for 100,000 people to find it out for themselves.

MR. RODGERS: In the church papers and magazines that Philo system has been advertised extensively. Do you know anything about that?

PROF. RICE: As I just said in regard to that matter of rearing small flocks as compared with large ones, I do not hesitate to say that the tendency of modern poultry husbandry is to give the hens a wide range and let them run in the fields and also to raise chickens out in the fields, and if they are allowed to run out in the crops they will make the land better, the trees better and if they are out on the meadows or pastures they will make the meadows better.

It is infinitely more economical to rear 4,000 chickens in flocks of 200 to 300 out in the fields and do the work by horse power and hopper methods than it is to raise 25 in a bunch by hand.

A Member: Will they improve the market crop?

PROF. RICE: If the crops and chickens are made to match properly, yes. For 20 years I have had the experience of growing chickens just that way. I can show you the pictures giving the results of what the effect is on plum, apple and pear orchards and show you similar results on corn fields. There is no place on earth so good and so fine for chickens as right out in the shade of the corn field, if the chickens are taken out there from the nursery when several weeks old. They should be kept up near the house for a few weeks. It gives the corn a chance to get up about a foot high. You must provide a roadway in front of the houses to leave water and feed once a week. This space can be sown to rape when the corn is planted and the chickens don't bother the corn to amount to anything. One year we had 2,500 chickens, about twenty houses right in a row on the edge of a corn field and they were there all through the season. They ate off the first rows of corn and the rest of the field was benefitted rather than injured. This could have been prevented by sowing dwarf Essex rape.

The CHAIRMAN: I am sure that this discussion is very interesting, but it is time to go on with the balance of the program for the evening.

The next item on the program is another illustrated lecture, on "Farm Management" by Prof. D. A. Brodie, Acting Agriculturist, Bureau of Plant Industry, Dept. of Agriculture, Washington, D. C. Prof. Brodie could not be here but has sent us instead Mr. J. A. Billings, of the Bureau of Plant Industry, U. S. Department of Agriculture, who will speak to us on this subject.

I now have the pleasure of introducing to you Mr. Billings.

Mr. Billings then delivered his address as follows:

FARM MANAGEMENT.

By J. A. BILLINGS, *U. S. Department of Agriculture, Washington, D. C.*

The work of the Office of Farm Management of the U. S. Department of Agriculture, embraces a study of the underlying principles which affect the profits of the farm. In this work very little attention is given to the carrying on of experiments, in fact, the object is to apply the results obtained by State Experiment Stations to use the methods employed by the most successful farmers in different sections, and outline the system of management best adapted for each particular section, after taking into consideration the local conditions, such as character of soils, location in regard to markets, and climatic or other changes which may affect the types of farming and cropping systems.

Farm Management differs from experiment station work in that it makes a study of the farm as a whole, that is, the organization of the farm in reference to the arrangement of fields, the location of buildings, the cropping system and rotation best suited for the maintenance of soil fertility, the distribution of labor on the farm, the amount of equipment necessary to operate the farm, and the proper system of keeping records and accounts in order to know what crops are the most profitable to grow, or what system of farming is best adapted under existing conditions. The agronomist tells us *how* to grow any particular crop, the preparation and cultivation of the soil, the use of manures and fertilizers to furnish plant food and maintain profitable yields of crops. The animal husbandman tells us *how* to feed and care for animals, the dairyman tells us *how* to handle the dairy products, but the farm management man first of all studies the question *what* is the best type of farming which is best adapted for his particular farm. After deciding what crops to grow and the acreage of each; what arrangement of the fields for the most economical handling of labor and equipment; what cropping system which will be the most profitable for the type of farming to be followed; what kind of animals and the number of each; what kind and amount of farm equipment which is best adapted for the particular kind of farming which is to be followed, and this takes into consideration the buildings which are best adapted for this purpose, the kind and number of farm implements, machinery, stock, etc.; what amount and the best distribution of labor and what cost of production for the different farm crops or products and the probable net income which will be derived from the farm. In other words, farm management answers the question *what* or *whether*, while agronomy, animal industry, etc., usually answers the question *how*, as applied to the farm.

The work of farm management is to make a study of the conditions of every particular locality in order to study the problems in that region, and where necessary, co-operative work is arranged, in order to carry out this investigation.

The arrangement of this discourse will be taken up in the same logical order as we make a study of any particular farm with reference to establishing a better system of farming for more profitable returns. This is given to you as a guide to enable each farmer to make a study of his own farm in the same way and to think out solutions for the many problems which every farmer has to meet. In order to do this, therefore, the first question to decide is the best type of farming which can be followed with profit, whether a livestock, grass or grain, fruit, market gardening type of farming, or any combination of each. After deciding this question, it is necessary to satisfy conditions. This question will cover the number of work stock, such as horses and mules, and the number of cattle.

THE FARM PLAN.

If livestock or dairy farming is to be followed, then it is particularly necessary to estimate the number of dairy cows which can be kept with profit on the farm. In order to do this, each farmer must figure out the amount of forage crops or grain necessary to feed each animal, and first of all one must decide on the ration for each kind of animal. For example,—suppose we have a problem to work out the best plan for a dairy farm. There are several feeding systems which can be followed, such as pasture in summer with no silage, pasture with silage, soiling crops without silage, soiling crops with silage, or silage for twelve months. These feeding systems may be more or less combined. It will first be necessary to find out the number of days or periods as for example, the number of days that silage is fed or the period of pasture, estimating the pounds of each material given during this period, for adult animals, for yearlings, for calves and for work stock. Then calculate the total amount of the different feeds necessary for the entire year. It will also be necessary to estimate the proportion of yearlings and calves to adult animals. As a general thing, we find that the average farmer will keep about one-half as many young stock, both yearlings and calves, as adult animals. In other words, in order to maintain the herd, we assume that there will be one-fourth as many yearlings as there are cows and one-fourth as many calves as cows, and in estimating the feed for each cow and corresponding young stock, calculate the amount of feed, both forage and grain, for one cow for the entire year and add to that one-fourth of the amount of feed necessary to support one yearling and one-fourth of the amount of feed necessary to support one calf.

After finding out the tons of feed of the different food materials necessary for one cow and corresponding young, find the acreage or the fraction of an acre necessary. Assume the average yield of farm crops, then divide the amount of each feed found for one cow and corresponding young stock by the yield per acre, which will give the acreage necessary. After determining the acreage of available land which can be used for farm crops or pasture, subtract from this acreage the acreage necessary for the work stock, and divide the remainder by the acreage necessary for one cow and corresponding young, which will give you the number of cows which can be kept upon the farm if the whole area is devoted for growing forage for the stock, if grain or other money crops not used for feed are grown, then the acreage of these crops must be deducted with the acreage for the work stock before we can determine the number of dairy cows which can be profitably kept.

In order to illustrate the establishment of a cropping system, an 80 acre farm is assumed of which 72 acres is available for crops or for pasture. We will suppose that 72 acres can be divided into six fields of 12 acres each for convenience of rotation. We will assume that the yield of farm crops per acre is as follows:

Yield of Farm Crops per Acre.

Corn,	60 bu.	Clover or mixed hay,	2 tons.
Oats,	40 bu.	Soiling corn,	10 tons.
Wheat,	30 bu.	Silage corn,	13 tons.
Potatoes,	180 bu.	Alfalfa (3 cuttings),	4 tons.
Soy beans,	20 bu.	Canada peas and oats, (hay)	2 tons.
		Cowpea hay,	1½ tons.

Several rotations may be established on such a farm in order to satisfy conditions, but some of them, however, will be of greater advantage in maintaining the fertility and keeping up the humus contents of the soil. An outline of some of these rotations, with the approximate number of work stock, dairy cows and young stock, is as follows:

Rotation I. 1. Corn. 2. Corn, 6 a. Oats, 6 a. 3. Wheat. 4. Clover and timothy. 5. Timothy and pasture. 6. Pasture.	Pasture: No Silage. Animals Kept: 3 horses. 1 bull. 10 cows. 2 yearlings. 3 calves.
Rotation I. 1. Corn. Oats, 4 a. 2. Silage corn, 4 a. Corn for ears, 4 a. 3. Wheat. 4. Clover. 5. Timothy. 6. Pasture.	Pasture: Silage. Animals Kept: 3 horses. 1 bull. 10 cows. 2 yearlings. 3 calves.

Rotation I.	Soiling: No Silage. Soiling Crops.	Acres.	When Fed.
1. Corn. 2. Corn. 3. Soiling crops, 6½ a. Oats, 5½ a. 4. Wheat. 5. Clover. 6. Timothy. Animals Kept: 4 horses. 1 bull. 16 cows. 4 yearlings. 4 calves.	Rye,	1½	
	Wheat, vetch & crimson clover,	1	May 13 to 24.
	Red clover,	1	May 25 to June 5.
	Peas and oats,	2	June 6 to 31.
	Early corn,	2	July 1 to 21.
	Cowpeas & Kaffir corn or sorghum,	1½	July 22 to August 11.
	Late corn,	1	August 11 to September 4.
	Cowpeas,	2	September 5 to October 1.

Rotation I. 1. Corn. 2. Silage corn, 5 acres. Corn for grain, 7 acres. 3. Soiling crops, 6½ acres. Oats, 5½ acres. 4. Wheat. 5. Clover. 6. Timothy.	Soiling: Silage. Animals Kept: 4 horses. 1 bull. 18 cows. 4 yearlings. 5 calves.
Rotation I. 1. Corn. 2. Corn for grain, 6 a. Corn for silage, 6 a. 3. Oats. 4. Wheat. 5. Clover. 6. Timothy.	Silage 12 Months: No Pasture. Animals Kept: 4 horses. 1 bull. 14 cows. 3 yearlings. 4 calves.

Rotation II.

1. Corn.
2. Soybeans for seed.
   Cowpeas for hay.
3. Wheat.
4. Hay.
5. Hay.
6. Pasture.

Rotation III.

1. Corn.
2. Soybeans for seed.
   Cowpeas for hay.
3. Potatoes.
4. Hay.
5. Hay.
6. Pasture.

Rotation IV.

1. Corn.
2. Silage corn, 9 a.
   Corn (grain).
3. Potatoes.
4. Alfalfa.
5. Alfalfa.
6. Alfalfa.

Silage for 12 Months.
No Grain Purchased:
Animals Kept:
4 horses.
1 bull.
18 cows.
9 young cattle.

Grain Purchased:
Animals Kept:
4 horses.
2 bulls.
42 cows.
21 young cattle.

Rotation V.
A three year rotation, 72 acres divided into 24-acre fields.

1. Corn.	2. Corn, oats or soiling crops.	3. Clover.

Pasture; No Silage:
Corn for grain, 24 acres; oats, 24 acres; clover hay, 12 acres; and clover pasture, 12 acres.
Pasture; Soiling:
Corn for grain, 24 acres; oats, 18 acres; soiling crops, 6 acres; and clover hay, 24 acres.
Silage 12 Months:
Corn for grain, 24 acres; corn for silage, 10 acres; oats, 14 acres; and clover hay, 24 acres.

Rotation VI.

Six Year Period—36 Acres.

Alfalfa continuously for five years.
The fifth year put 12 acres to corn.
The sixth year, 24 acres to corn.
The seventh year, the three year rotation established.

Three Year Rotation—36 Acres.

1st.	Corn	Corn	Clover
2nd.	Corn	Clover	Corn
3rd.	Clover	Corn	Corn
4th.	Corn	Corn	Canada peas & oats
5th.	Corn	Peas & oats	Alfalfa
6th.	Peas & oats	Alfalfa	Alfalfa
7th.	Alfalfa	Alfalfa	Alfalfa

Rotation VII.

1	2	3	4	5	6
Alfalfa*	Corn	Corn	Wheat	Clover	Timothy
Alfalfa	Corn	Wheat	Clover	Timothy	Corn
Alfalfa	Wheat	Clover	Timothy	Corn	Corn
Alfalfa	Clover	Timothy	Corn	Corn	Wheat
Alfalfa	(Timothy, peas & oats, potatoes).	Corn	Corn	Wheat	Clover
Corn	Alfalfa	Corn	Wheat	Clover	Timothy

*The alfalfa field may be permanent as long as profitable then brought into the regular rotation and a new field devoted to this crop.

Some other Rotations Followed:

1. Corn.	1. Potatoes.	1. Wheat.
2. Wheat.	2. Corn.	2. Corn.
3. Clover.	3. Potatoes.	3. Canada peas and oats or potatoes.
4. Wheat.	4. Wheat.	4. Clover.
5. Clover.	5. Clover.	5. Timothy.
	6. Timothy.	6. Timothy.

Cover Crops for Green Manure:

Rotation I.

At last cultivation of corn.

Rotation II.

At last cultivation of corn.
After each crop of potatoes.

Rotation III.

At last cultivation of corn.

In *Rotation I*, where the pasture system is followed, the number of animals which can be kept profitably on the farm will be governed by the acreage available for pasture, and in this case I have assumed that there is no permanent pasture, except a small paddock near the buildings, but that the pasture will come into rotation. There will also be sold wheat, hay, or other crops in some cases over and above what is necessary for feed for the animals. The grass incomes from this 80-acre farm for the different feeding systems under this rotation vary but little, at the average farm prices, and will be approximately from $1,900 to $2,500. From this must be deducted the expense for labor, farm equipment, interest and depreciation, fertilizers, etc., although for a live stock type of farming very little fertilizer will be necessary if the rotation is arranged as suggested.

In *Rotation II* soy beans and cowpeas have been introduced as a crop to follow corn, the object being chiefly to introduce a leguminous crop to improve the soil texture preceding the wheat and to much better maintain the fertility of the soil. Soy beans may be introduced as a profitable crop in Pennsylvania, either for hay or for seed. The latter can be ground and fed to the farm animals or may be sold in market, as there is demand for soy bean seed. Cowpeas may also be grown for hay in the more southern parts of the State, but this crop is not as profitable a seed crop as the soy beans. The feeding value of soy bean meal may be shown by the chemical analysis and digestibility experiments which give the total digestible protein in soy bean meal about that of linseed meal. In many parts of the State of Pennsylvania this crop may profitably be substituted for oats in the farm rotation.

Rotation III varies from Rotation II only in the substitution of potatoes in place of wheat. This is applicable only on those soils which are better suited for growing potatoes. The total income from Rotation III will be somewhat greater, varying from $2,500 to $3,100 annually, but on the other hand, there will be a greater expense for labor in growing the potato crop and probably an additional expense of $175 to $200 for commercial fertilizers.

Rotation IV introduces alfalfa, a very profitable crop for the dairy farmer, and this crop can be profitably grown in a great many parts of the State. Alfalfa may be grown permanently for five or more years, before reseeding or rotating, or alfalfa may be placed in a rotation for three to five years, as suggested. The great advantage of this rotation is its influence in improving the soil, as alfalfa is a soil builder, while the grasses and cereals are soil exhausters.

Rotation IV, in which potatoes enter, gives a very desirable crop preceding alfalfa, but in order to seed to alfalfa after potatoes, it will be necessary to grow early potatoes, which can be marketed about August 1 and which will enable the alfalfa to be sown before September 1. If potatoes are not profitable, in any section, Canada peas and oats may be substituted, mowed for hay the latter part of June or early in July, and the field quickly plowed, or perhaps simply disked and allowed to lie fallow with weekly cultivations until the latter part of August, when alfalfa may be sown. Under some conditions, such as on limestone soils that have considerable clay, it may be necessary to fallow the land from early spring until July, then seed to alfalfa.

Alfalfa is a profitable crop for feeding livestock or for market. At present the price for alfalfa hay is fully as high or higher than for good timothy hay and as a rule, under favorable climatic conditions, we can depend upon at least four tons of marketable alfalfa hay per acre. Furthermore, this hay has a much greater feeding value as far as protein is concerned, than grasses or even clover and nearly equals the feeding value of wheat bran.

The gross income from this rotation, basing alfalfa at market price, is greater than for any other rotation which can be followed on the farm, and varies from $4,000 to $5,700, depending on the number of animals which are kept and the amount of grain which is purchased. An interesting fact is that 42 cows can be kept when the necessary grain feed is purchased, but the net income, after deducting the cost of grain and labor, from 42 cows is but little greater than where 18 cows are kept and all the feed is grown on the farm.

Rotation V, which is a three year rotation, gives clover once in three years and is therefore a good cropping system for maintaining the humus of the soil. The income, however, from this rotation is slightly different from Rotation I.

In *Rotation VI* it is assumed that the 72 acres is divided into two fields and that 36 acres of alfalfa may be grown continuously for five years, while the other half of the farm is devoted to a three year rotation. The advantage of this system is that where alfalfa can be grown successfully it may be far more profitable to let this field stand permanently as long as possible before reseeding, and when it is necessary to change, the half of the farm devoted to rotation can gradually be seeded to alfalfa and rotation established on the alfalfa area.

Rotation VII is best suited to a farmer who desires to keep permanently as long as possible only a small field of alfalfa. When it is advisable to change, any other field may be seeded to alfalfa, as suggested in the outline, and the area devoted to alfalfa be placed in the regular rotation.

With all of these rotations it is very desirable to grow cover crops, which can be used for plowing down in the spring as green manure, seeded at the last cultivation of corn or after potatoes, when potatoes is to be followed by some crop which will be planted the following spring. For this purpose, we suggest the planting of hairy vetch, especially on soils of sandy nature, but it is more advisable to sow with the vetch some rye, wheat, crimson clover, or a combination of each, which will give a support to the vetch and more vegetable matter to turn under. We suggest where rye and vetch or wheat and vetch are sowed to use a half bushel to three pecks of rye or wheat with 18 to 25 pounds of vetch. Several successful farmers are using 25 pounds of vetch with five to six pounds of crimson clover per acre, and some are planting vetch alone at the rate of 40 pounds per acre. One-half bushel of rye or wheat with 18 to 20 pounds of vetch and 5 to 6 pounds of crimson clover, in the regions where crimson clover can be grown, is a very desirable mixture.

FARM EQUIPMENT.

The kind, amount and efficiency of farm equipment is a matter which is receiving considerable study by our office. Very little attention has been given hitherto to the study of farm equipment, especially in regard to the requirements on farms of different areas and different types of farming. Dairy buildings, and especially the stables for dairy cows, has received considerable attention in the last few years and the Dairy Division of this Department is recommending plans for sanitary stables. However, my observation of many dairy buildings shows that on many farms which are producing high grade milk, a great many of the stables are very expensively equipped, whereas on other farms equally good milk is being produced from more simple construction of stables. I have in mind a farm in Susquehanna county which is sending to New York milk which receives nearly as high a score in cleanliness as any other milk shipped to the city, yet the buildings are very simple. The production of clean milk perhaps depends largely upon the individuality of the man as upon the equipment. Clean milk may be produced under very simple though sanitary conditions, if great care is used in the care and handling of the product from the time the milk is drawn until it reaches the consumer.

The style of farm buildings and stables in different regions varies widely. Pennsylvania has a peculiar type of structure of barn which is seldom found in other states. These barns have the stables in the basements, which are usually dark, poorly ventilated, and unsanitary. Such stables, however, can be easily modified, giving more healthful conditions for animals, by building a one-story ell with concrete floors and very simple sanitary interior fittings. Such a stable has recently been erected by the U. S. Indian School at Carlisle, Pennsylvania, from plans by this Department.

Another style of barn, very applicable to regions where considerable grain is grown, is a covered yard type of stable with storage above, and an arrangement for stanchioning cows at the time of feeding. This covered yard may be entirely enclosed, with side windows, and a sanitary milking stable addition adjoining this building in which the milk may be produced as cleanly as from any other system. A stable of this kind was built a few years ago near Columbus, Ohio. It was large enough to accommodate 60 cows my dividing the covered yard into two yards holding thirty cows each. The silage and all roughage is fed in this covered yard and the grain feed may be fed here or may be fed in the milking stable during the time of milking. The advantage of this system is that it enables the farmer to utilize a great deal of the straw, and overcomes the necessity of cleaning stables daily. Where plenty of bedding is used, the cows are usually as clean as ordinarily found in the other type of stable, even where considerable care is given to grooming and cleanliness. In such a system it is necessary to give 80 to 100 square feet of space per animal. If the storage above the covered yard is arranged for hay in the center and straw in the wings, then the amount of labor in caring for the animals can be reduced to a minimum. This system ought to appeal to farmers in parts of Pennsylvania, especially in Lancaster county, where the rotations call for considerable acreage of wheat and where, as a usual thing, a great many steers are fattened for market.

In making a study of the equipment on the farm, each owner must carefully consider principally the type of farming and the simplest requirements for the storage and handling of his crops. A truck or fruit farmer may not require near as much expenditure in buildings as a hay, grain, or dairy farmer. The problems of working out standards for equipment for all different types of farming is receiving special attention in this office.

Another problem which each farmer should carefully consider is the amount of equipment in farm implements and machinery. As stated for farm buildings, many farms are over-equipped in this respect, while many others do not have the amount of equipment necessary to handle the farm economically. The question of the most efficient tillage implements is also of vital importance, and a knowledge of the best methods in preparing land and cultivation of crops is very essential, in order to plan on the amount of farm equipment necessary. The farm roller is an implement which probably is necessary on every farm, but very little attention has been given to what kind of a roller is most efficient. The efficiency of an implement to compact the soil was brought to my attention the past year, in those regions which suffer the most from drought. In New Jersey it is customary to seed down to clover and timothy or alfalfa the latter part of August, after harvesting a potato crop or some early crop, which allows the field to be cleared in August. Many fields of clover and timothy and some plantings of alfalfa this past year were not a success, due probably to the inefficient work of the ordinary farm roller, and under such conditions it may be necessary to have an implement with a corrugated surface or with a series of convex disks set closely together in order to compact the subsurface of the soil. On several fields where potatoes had been harvested and the vines had been raked off with the ordinary horse rake, even where this failed was rolled after preparing by a disk harrow, the seed failed to germinate, which shows where the wheels of the horse rake compacted the soil, which shows conclusively that under dry conditions the ordinary plain roller superficially compacts the surface. There are several implements being placed upon the market, which compact the subsurface and which should receive the attention of farmers.

Many implements for cultivation are now placed upon the market which are equipped with blades or knives for cutting the surface without going very deeply into the soil. Such implements are very efficient for the later cultivations of crops in that they simply loosen the top soil, prevent the cutting off of feeding roots, prevent the evaporation of soil moisture from a lower depth and provides a dust mulch to conserve the moisture.

The Office of Farm Management also makes a study of the efficiency of farm implements, with a view to economy of labor. It is often an important question to what extent a farmer may employ larger implements which require a greater number of horses and thereby decreasing the amount of man labor. In many sections of the East it may be entirely practical to use large power machinery, especially the traction plow, and the traction engine for other farm operations. The traction plow is already in operation in New Jersey and Pennsylvania, and where the fields are comparatively large and level, especially where the fields are rectangular, with a long course before is is necessary to turn, such expenditure may be economy. There are many farms which could be arranged for the practical use of a traction plow by rearranging the fields.

The problem of farm equipment I consider has not been solved as yet, by any means, and the farmers should assist the Department in giving their inventories of farm tools, in order that this office may secure data enough to establish some standard for farms of different areas and types of farming.

RECORDS AND ACCOUNTS.

One of the most important farm management problems is the establishment of some simple system of records and accounts, which will enable the farmer to know more definitely the cost of production of farm products, and the distribution of labor on the farm, as influenced by his farm conditions. One of the important questions of the day among business men is the establishment of scientific management, which will give greater efficiency. The study of efficiency in operating large plants has been perfected in many places so that the manufacturer is realizing greater profits. The efficiency and distribution of farm labor is a problem also which is one of the most important on the farm. The farmer should know the cost of feeding and caring for the different animals; he should know the cost of labor, both horse and man labor for the different crops; he should know the production and cost of production of dairy products, in order to have an accurate knowledge of the profits and losses on the farm. Many farmers are beginning to realize the necessity of keeping careful records and are establishing systems which will give them this data. In most cases, however, this is done on large farm propositions where the records and accounts are kept by a bookkeeper hired for that purpose. The small farmer, however, needs this information just as much, and a simple system of keeping his accounts may be devised, which, while not absolutely accurate, will give enough of this information to determine what profits are being made on the farm.

The Office of Farm Management has for some time been keeping records on a number of farms, doing the tabulation in the office, by a system of daily record blanks, especially designed fo getting the information which this office needs. The summaries of the yearly records on many of these farms are extremely interesting and suggest many things of importance in their business management.

In order to show the importance of this work and what a careful keeping of farm records actually means, the following tabulations of the cost of growing corn, the maintenance of an ochard and handling the apple crop, is given.

TABLE I.

Compiled by Office of Farm Management, U. S. Department of Agriculture. Wisconsin Farm.

1909. Crop Corn—Ensilage. 15.38. A. Field "a-1."

	Dates.	Total.			Per Acre.			Remarks.
		Man hours.	Horse hours.	Cost.	Man hours.	Horse hours.	Cost.	
Care seed corn,	4/21-6/19,	49¼		$6.56	3.20		.427	
Plowing, 5 inches deep,	6/ 1-10,	88¼	264¾	38.25	5.74	17.22	2.487	John Deere.
Dragging,	6/ 7-14,	20½	45¾	7.30	1.33	2.97	.475	Spike tooth.
Discing,	6/11-14,	14¾	44¼	6.41	.96	2.88	.417	John Deere 12 Discs.
Planking,	6/12-15,	10½	22	3.60	.68	1.43	.234	3 planks 12 feet.
Planting,	6/12-16,	25½	37½	7.15	1.66	2.44	.465	John D. Check Row.
Dragging,	6/16-19,	20¼	44	7.10	1.32	2.86	.462	Spike tooth.
Replanting,	6/24-26,	10¾		1.43	.70		.093	Hand planter.
Cultivating:								
1st time E&W,	6/26-7/7,	22¾	45½	7.58	1.48	2.96	.493	Sulky 2 h riding.
2nd time N&S,	6/29-7/17,	47¾	59½	12.31	3.11	3.87	.801	1 & 2 horse cult.
3rd time E&W,	7/10-21,	27½	55	9.17	1.79	3.58	.596	Sulky 2 horse.
4th time N&S,	7/21-27,	44	79¾	13.84	2.86	5.19	.900	1 & 2 horse cult.
5th time E&W,	7/28-31,	34½	58	10.40	2.24	3.77	.676	1 & 2 horse cult.
Hoeing,	7/ 1-9/8,	592¾		79.03	38.55		5.139	
Cutting,	10/ 6-23,	119½		15.94	7.77		1.036	
Hauling and siloing,	10/ 6-19,	427	383	95.23	27.76	24.90	6.192	
Total labor cost,		1,555½	1,139	$321.30	101.15	74.07	$20.893	
Seed—Silver King,				10.70			.696	214 ℔s. @ 5c. ℔.
Equipment,				26.89			1.748	
Taxes,				7.69			.500	
Interest,				76.90			5.000	
Total cost,				$443.48			$28.837	

YIELDS.

192 loads silage @ $3.00,	=	$576.00
32 shocks fodder corn @ 75 c.,	=	24.00
3½ bu. seed corn @ $3.00,	=	10.00
Total,		$610.50

SUMMARY.

	Total.	Per Acre.
Income,	$610.50	$39.70
Cost,	443.48	28.84
Profit,	$167.02	$10.86

Rates per hour: Man hours, 13 1-3 c.; horse hours, 10 c.

TABLE II.

Compiled by Office of Farm Management, U. S. Department of Agriculture.. N. Y. Farm.

1910. Crop: Orchard, 4½ Acres. Field "H."

	Dates.	Total.			Per Acre.			
		Man hours.	Horse hours.	Cost.	Man hours.	Horse hours.	Cost.	
Scraping trees,	3/ 1–28,	25		$5.00	5.56		$1.112	
Pruning trees,	3/28–4/2,	100		20.00	22.22		4.444	
Spraying,	4/4–9,	28¾	28¾	8.63	6.39	6.39	1.919	Lime sulphur.
Piling and drawing brush,	4/16–20,	16	7	3.90	3.55	1.56	.867	
Plowing,	4/22–23,	27	54	10.80	6.00	12.00	2.400	
Spraying,	5/ 2–6,	13	8½	3.45	2.89	1.89	.767	Bordeaux.
Harrowing,	5/ 9,	4	8	1.60	.89	1.78	.356	
Harrowing,	5/16–17,	4	8	1.60	.89	1.78	.356	
Spraying,	5/24–26,	27½	34	8.90	6.11	7.56	1.978	Bordeaux.
Harrowing,	5/26–6/8,	4½	9	1.80	1.00	2.00	.400	
Spraying,	5/31–6/4,	20½	11	5.20	4.56	2.44	1.156	Bordeaux.
Cultivating,	6/ 7,	3	6	1.20	.67	1.33	.267	
Spraying,	6/18–20,	13	13	3.90	2.89	2.89	.867	Tobocco Ext.
Cultivating,	6/24–7/13,	13	26	5.20	2.89	5.78	1.156	
Sow clover,	7/13,	1		.20	.22		.044	
Dragging clover,	7/13,	1½	3	.60	.33	.67	.133	
Rolling clover,	7/13,	2	4	.80	.44	.89	.178	
Thinning apples,	8/13,	10		2.00	2.22		.444	
Picking apples,	10/ 3–17,	299½		59.90	66.55		13.320	
Picking up and drying apples,	10/ 4–17,	55	22	13.20	12.23	4.89	2.933	
Drawing apples,	10/ 3–18,	27½	61¾	11.67	6.11	13.73	2.594	
Total labor cost,		695¾	304	$169.55	154.63	67.52	$37.691	
Manure charge (50 per cent. of 1910 charge),				20.71			4.602	
Spraying materials plus hauling,				15.80			3.511	
Clover seed—½ bu. @ $9.00,				4.50			1.000	

Barrels—488 @ 35c. each,			170.80			37.955	
Equipment charge,			28.79			6.395	
Taxes,			3.15			.700	
Interest,			31.50			7.000	
Total cost,			$444.80			$98.854	

YIELD.

488 bbls. apples @ $2.50,	=	$1,220.00	108.4 bbls. per acre.
Drying apples,		100.00	
Total,		$1,320.00	

SUMMARY.

	Total.	Per Acre.	Per Bbl.
Income,	$1,320.00	$293.330	$2.71
Cost,	444.80	98.854	.91
Profit,	$875.20	$194.476	$1.60

Assumed rates per hour: Man hours, 20 c.; horse hours, 10 c.

Some figures on the cost of feeding dairy cows for the production of milk are very interesting. The average cost of feeding and caring for an animal from its birth until it became an adult, which was about two years, secured by keeping accurate record of a dairy herd in Wisconsin, shows that under a very simple system of management the cost of feed and labor amounted to $50.08. The cost of feed during this period was $42.01. The cost of labor was $8.07. The feed was charged at market prices, man labor at 12 cents per hour and horse labor at 10 cents per hour. The young stock were pastured for about three months during the summer, for which there was no labor charged. An interesting fact in connection with this is that for the first two months the cost of both feed and labor was the greatest of any part of this period. During the winter months it remained fairly uniform and was the lowest during the summer.

Another line of work which has received considerable attention in our office it what might be called conducting an agricultural survey. This is a canvass of all the farmers in a township and securing complete data on the incomes and expenses of the farm. In this work, attention was given to the early training and preparations for farm life and one of the most interesting deductions from farm surveys in New Hampshire is that the average net income from farmers which received a high school training was considerable above the income from farmers who only attended the district school.

The CHAIRMAN: Have you any questions you desire to ask on this subject?

A Member: Have you worked that system out practically?

MR. BILLINGS: Yes; it has worked out in several cases. I do not know of just that system in this State or New Jersey, but it has worked out in the West, I know positively in Oklahoma.

A Member: Do you know of a case where clover does not follow alfalfa?

MR. BILLINGS: Does not do well after alfalfa?

A Member: Yes sir.

MR. BILLINGS: No; I have not found any fields where clover is following alfalfa. Where alfalfa has proven profitable and successful to grow it has been kept down permanent and they have not reseeded to clover.

A Member: After we have had alfalfa for five years and have followed with the regular crop rotation this season we have put in clover. The other field is nicely set but the patch that was in alfalfa has hardly any clover. You can see the line.

MR. BILLINGS: It may be necessary to inoculate for your clover. I would want to study the problem a little before I can give you a definite answer.

A Member: The rest of the field is growing clover and the whole field did not grow clover before. It looks very much as though it was something that was not favorable to growing clover following alfalfa.

MR. BILLINGS: I would be glad to talk this over with you and perhaps we can study what the trouble is. I have not found any cases like it. I never found any place where alfalfa was followed with clover.

A Member: I see you have corn, oats and wheat once. Do you sow grass then where you sow alfalfa?

MR. BILLINGS: Will you kindly put in that slide again? I think I tried to show there that in order to change over the clover in this field what would follow is to be mostly grass. That would be plowed up early in the spring, preferably so, and planted to peas, oats or to potatoes, either one, early potatoes; then seeding down to alfalfa and it might be possible to turn under that timothy sod if he is going to try to reseed but I doubt the practicability of that. In fact, it is better to put on a cultivating crop one year. Potatoes we find is an excellent crop to reseed preceding alfalfa and in Jersey we have several cases where alfalfa has been grown after the early potatoes with marked success. I have just returned from a field over in the State of Jersey and in the three days I was there I saw between three and four acres of alfalfa and this alfalfa was planted in August after the early potatoes, without replowing, simply harrowing and seeding.

The CHAIRMAN: This closes our program for this evening. We will now adjourn to meet at 9.30 to-morrow morning when we have another interesting program.

Thursday Morning, May 25, 1911, 9.30 O'clock.

Mr. B. F. Killam in the Chair.

The CHAIRMAN: We will now proceed with the program. This should be one of the most interesting sessions. I do not see as many people here as yesterday afternoon, but let us give the instructors the best attention.

The first item on the program is "Needs of Rural Schools," by Miss Sara C. Lovejoy, of State College, Pa. It affords me pleasure to present Miss Lovejoy to you.

MISS LOVEJOY: Ladies and Gentlemen. It is a very good thing to be a lady this morning because the ladies come first, and I can say what I please and those who come after me will have to answer for it.

Miss Lovejoy then presented her address as follows:

THE NEEDS OF OUR RURAL SCHOOLS.

By MISS SARA C. LOVEJOY, *State College, Pa.*

The needs of our rural schools are fundamentally the same as those of all schools, based on the common object of all education. Every one who aspires to the name, "Educator," and even those of us who can claim no higher title than "teacher" are thinking some pet theory as to what education really is, but from the many definitions, as numerous as are the definers, we may select as one of the best that of a leading college president: "The object of all education," he says, "is to train men and women for intelligent citizenship." The schools of our rural communities should, therefore, fit the boys and girls for their duties as men and women. Are they doing this?

Before we can answer this question we must consider what these duties are for which training is needed. First for the home, the one institution of our land in which all the people share, and in the building of which every one has a part. We have long recognized that boys who were to become physicians, ministers, or engineers must be especially trained for their professions. It is time that people admitted that home-building is no less a profession than are these others and that they who are to administer the work of the household should be definitely trained.

In our rural districts, however, as in our cities, we do something besides live in homes. Their material needs must be supplied and that necessitates a directly lucrative occupation. Now the one business upon which all people, whether dwellers in the open country or in crowded cities depend is that carried on in our rural communities,—agriculture. Stop that, and how would the people of this land live? Financially, it is worth more in this State than are all the other occupations combined, including mining and the oil industry. Is it not a business, therefore, for which there should be definite preparation in the schools where the future farmers and farmers' wives are being trained for intelligent citizenship. How can agriculture develop, how can it keep the place it should hold, that of our foremost industry, unless the people who engage in it are as well-trained as are the people engaged in other occupations?

The reason, then, for the study of Home Economics and Agriculture in our rural schools is to increase the power of the rural districts by giving to the boys and girls such a thorough mastery of their business that they will realize its importance and will more readily remain on the farms. It must be recognized that one reason why young people are flocking to cities is that they feel that farming and housekeeping are drudgery and that there is no chance to "rise." There is always a chance to rise when one is studying his work and making it progressively better.

In addition to introducing these technical branches, our rural schools should also better relate their present courses of study to the facts and interests of daily life, so that education may not lead away from the home, but toward it. A problem in arithmetic is of as great educational value when it deals with the division of the income of a family in such a way as to allow the proper proportion for food, for clothing and for housing, as when it deals with the proportionate amount of capital invested by the several partners of a business firm. Attention can be called to matters pertinent to the welfare of family and of livestock if other problems set the children to figuring the required amount of nitrogenous food in a balanced ration either for man or for beast. A geography lesson can be made interesting in itself and may be related to matters of daily life if, instead of being required to learn mere lists of exports, imports and agricultural products of China, Japan and other distant lands, the children are at the same time, given instruction as to the uses of some of these exports in our own households, for instance tea, coffee, rice and sugar; or if they taught something of the agricultural methods employed in other countries. This suggests that in raising the standard of our rural schools, we are not asked to put out of the curriculum the common branches which all recognize as necessary, in order to teach some subjects which many people feel are distinctly "new fangled" and unnecessary. On the contrary, the aim should be to co-ordinate all the work so that it shall be of the greatest practical value.

This is not the time or place to take up in further detail the courses of study. We can merely indicate in general the chief needs of our schools. Later speakers will present methods for instruction in agriculture. All that I can hope to do is to urge you most strongly to introduce into every school, courses in Domestic Science and kindred subjects. The first objection to this is that matters pertaining to the home can best be learned there. If cooking were all that is included in Home Economics, doubtless most mothers would claim the ability to teach their daughters, although many an experienced housekeeper is often forced to admit that luck rather than science guides her own cooking processes. Much more, however, is included and should be understood by every woman who has the responsibility of directing a household. She should know not merely how to cook, but how to combine foods into a properly balanced ration. This implies a knowledge of the needs of the body, and of the foods supplying these. The soil and the cattle on our farms require nitrogen and lime—so do human beings, but the amount needed by the latter is less generally understood. Moreover, a lack of any of the necessary food elements means a form of starvation, which cannot be prevented by an increased amount of another food element. Since a knowledge of these principles is essential to the complete well-being of our families, this should, very evidently be taught in our public schools if they are to train for intelligent citizenship.

The principles of hygiene and sanitation also belong in the curricula of our rural schools. We have a State law requiring that temperance be taught in all public schools. This is a wise step in freeing the country from a great evil. But one-half the cases of intemperance are caused by improper food. When the body is not properly nourished, a craving for some stimulant is created. Moreover, intemperance is not confined to excess in drink, indiscretion in eating cause many bodily ills. The pupils in our schools should, therefore, be taught the laws of health in regard to eating as well as to drinking.

A well organized crusade against tuberculosis is attracting the attention of people everywhere, and we welcome every effort put forth to stamp out this plague. Preventative work, however, is better than curative, and here again the school is the place for instruction. When school houses are properly built and cared for in regard to ventilation and sanitation, when the common drinking cup is banished, and the pupils are taught why clean houses, fresh air, pure water and clean bodies are necessary to good health then there will be less tuberculosis to fight. If only once a week definite instruction were given concerning the dangers lurking in the dust that clings to our clothing and furniture; in the air of a close room; in the cup passed from student to student; in the touch of a fly flitting from the filth of improperly cared for barns to the food on our tables, and in other matters vital to health, we could soon see a distinct rise in the standard of public health. It ought not to be necessary to emphasize the importance of these matters in rural communities where pure air, good water and proper sanitary conditions are so easily provided, but repeated experience proves that we who live in the country often disregard the laws of health more than do people in cities.

One reason why many people fail in agriculture is because they do not put it on a business basis. They do not know their exact capital invested, or the income derived therefrom, and cannot tell whether they are making money or losing, until too late they find out to their sorrow. For this reason every rural school should include in its instruction a business training, not the stenography and banking which are usualy associated with that term, but a study of the finances of the farm and the farm home. If the merchant must know the proportion of his income which he should invest in advertising in new equipment or in enlarging his business, the farmer, no less, should know his financial status, and the farmers' wife should realize her responsibility since the expenditures for the home are largely under her direction. As has been said before, much of this may be introduced with the usual arithmetic and book-keeping taught in most schools. It is not a new subject, but a practical application of an accepted branch of common education.

So much can be done, then, by the progressive teacher whose desire is not so much to follow well-worn educational paths, as to adapt her instruction to the needs of present day life. This, however, is not enough. As we have seen, some definite technical work is needed for the future home-maker, and the problem of introducing the subject into rural schools becomes difficult. It seems to require special teachers and special equipment, impossibilities in communities where school taxes scarcely provide for the present inadequate facilities.

This condition of affairs emphasizes the need of consolidated rural schools. Why is it that Pennsylvania is so far behind other states in this matter? We look in vain through the pages of the report on Consolidated Rural Schools issued by the office of Experiment Stations and the Bureau of Statistics, for any mention of Pennsylvania. On the contrary, the shabby, isolated school buildings which we all know are a disgrace to this, one of the richest states of the Union. Better buildings, better school grounds, more adequately paid teachers, and then we shall have wider courses of study and a rising generation of more efficiently trained citizens. Concentration of capital, whether in trusts, or in school management brings higher returns, and in the case of schools, the general public receives the benefit of these returns—it may not be out of place to quote from the report already referred to :—"The fusion of a number of small districts into a larger administrative unit furnishes a stable and extensive basis for financing the school and thereby makes for higher efficiency. An incentive is given to make permanent improvements to beautify the school grounds, secure modern sanitation, and provide ample school room equipment. Studies can be introduced which require specially trained teachers, such as agriculture, home economics, manual training, music, advantages almost unattainable in small district schools. These centrally located country-life schools, too, form convenient social centers for communities; local interests and activities affiliate with the schools, so that public use is frequently made of their commodious class rooms or auditoriums."

Pennsylvania should follow the example of her neighbor, Ohio, and of many western and southern states in this respect, but until she does, we must find a way of meeting existing conditions. The problem has been solved in Maryland and elsewhere by means of a special teacher of Home Economics, hired jointly by the several schools of one township or of adjoining townships. With a convenient traveling equipment she is able to go about spending one day, or part of a day, each week in a school. The equipment may include a denatured alcohol stove, if possible one supplied with a portable oven, a home-made fireless cooker, a small supply of cooking utensils; sauce-pans, measuring cups, mixing bowls, spoons, knives, baking pans, and other most necessary articles. This can be packed in a trunk or box and taken from place to place. The pupils in each school are instructed what supplies to provide for each lesson, and if the whole is arranged systematically, the work is most successful.

Better still is it to have a packing box equipment in each school house. The boys can be pressed into service to construct cupboards from packing boxes easily obtained, and the necessary utensils can be packed conveniently away between lessons. If the building is so arranged that a separate room can be provided, so much the better, but if not, a table at one end of the regular room must do. If a permanent one is not possible, one constructed by means of boards placed on wooden trestles, or on the desk tops will serve the purpose. Often the stove used for heating the room may be utilized for cooking.

The question naturally arises as to whether such work will not interfere with other classes in the same room. It need not, if discipline is properly maintained. Another question is regarding the cost of such an equipment. It can be provided according to its completeness, at from $10 to $100; I have seen a satisfactory one for less than $30. If there is sufficient interest in the matter, donations of utensils and supplies by the people of the community often reduce the cost of equipment and maintenance.

The object of such a course in cooking and a study of food principles, as of all else included in the broad term Home Economics, is two-fold; to train efficient home makers, and to raise the standard in the home, so that the dignity and importance of household tasks may be better appreciated. We have false standards when we feel that person who works in a kitchen is performing service less worthy than the girl who manipulates a type-writer in an office.

A direct result of this course may be the solution of one of the serious problems of school life—the noon lunch. We nearly all recognize as injurious the cold luncheon, consisting often of a combination of indigestible food, served in an unappetizing manner. Nevertheless, it has seemed impossible to avoid this entirely. Even though we may chose more nutritious articles and see that they are packed so carefully as to be palatable when lunch time comes, still a cold mid-day meal is poor sustenance for growing children. With the introduction of cooking into our schools we may hope to improve conditions very materially. Each day the lunch brought from home may be augmented by some one hot, nutritious article served at a trifling cost. The planning may be done by the teacher, the work by the pupils, those only being allowed to help whose lessons are prepared. The ever useful fireless cooker is of assistance here as a means of cooking and keeping hot, cocoa, meat stew, beans, maccaroni and cheese or other wholesome articles. Another bad feature of the usual school lunch, aside from its effect on health, is carelessness regarding table manners, and a general disregard of order. This also may, to a large extent be welcome if a more regular noon meal, served neatly indoors, takes the place of the contents of a lunch pail hastily devoured on the school house steps.

Some of you are ready to object that the school program is already over-crowded and that the introduction of subjects hitherto considered a part of home training will over-work both teachers and pupils. When a special teacher can be hired by several schools, no additional work need be put upon the regular teacher, and even if this is not possible, most teachers who have undertaken the work have found that the children enter into it with such zest, and return to their other studies with so much more enthusiasm that the strain of teaching seems less severe. Others will object that Home Economics is merely a fad. Is any subject a fad which helps people to live according to higher standards, by teaching them how to observe better the laws of health, how to be prudent in the use of time, strength and money, and by making a study of the home of supreme importance? You say that there is nothing to be learned in school about house-keeping and home-making, we immediately put these occupations upon a lower plane than others, since we admit that twentieth century methods are better than nineteenth for most things. Scientific methods are accepted in the business world, why not in the home?

If we are to have Home Economics permanently in our schools, we must of necessity have properly trained teachers, and here a more serious difficulty presents itself. However, with the required introduction of this work into Normal Schools, and with the course already established at the Pennsylvania State College, opportunities are being offered for their preparation. For these teachers in schools where no facilities for work are provided by the board of education, and where no regular courses can be taught, a beginning may be made through the noon lunch, which may develop later into a complete course. The summer course for teachers at the Pennsylvania State College, while it cannot give in six weeks a complete professional training in Home Economics, offers much that is valuable to those who wish to know how to start work through the lunch or in some other small way.

Let it not be thought that all the needs of our rural schools will be supplied by the introduction of Home Economics into the curriculum.

We need, as has already been stated before, a more liberal appropriation for school work making possible better buildings, more attractive grounds, more adequately paid and, consequently, better teachers and a closer co-operation between school and home. However, one very definite step toward some of these needed improvements will be taken when Home Economics and Agriculture are introduced into every rural school.

The CHAIRMAN: You have heard this subject treated. Are there any questions to be asked? The ladies must be interested. If there is no discussion we will go on with the next number on the program: "Some Lessons We Should Teach," by R. P. Kester, Grampian, Pa. Is Mr. Kester present?

DEPUTY SECRETARY MARTIN: Mr. Kester has been present at our sessions. I do not know the cause for his absence now.

MR. LIGHTY: Mr. Kester was called away and wanted to come back this morning. Possibly his train may not have arrived yet.

The CHAIRMAN: We will take up the next subject: "The Present Trend of Agricultural Education," by Prof. L. A. Clinton, Director Experiment Station, Storrs Station, Conn. Is Prof. Clinton here? He does not appear to be present now, so we will take up the fourth item on this morning's program: "Country Schools for Farm Life," by Prof. Thos. I. Mairs, State College, Pa.

I have the pleasure now of introducing to you Prof. Mairs.

PROF. MAIRS: Mr. Chairman, I am here. I was not expecting to be called upon so early on the program. I was thinking I would have Mr. Kester's talk and Prof. Clinton's address to use as the basis for my own talk this morning, but apparently I have got to begin at the beginning, or to start some talk of my own. Miss Lovejoy has very ably handled a part of the subject this morning, but the subject is such a wide one that it is impossible to cover it all in any one talk or two talks or any dozen talks.

Prof. Mairs then delivered his address as follows:

COUNTRY SCHOOLS FOR FARM LIFE.

By PROF. THOS. I. MAIRS, *State College, Pa.*

It is acknowledged by nearly all that the country schools are not serving their purpose so well as they once did. The object of all education is to adapt the pupil to his environment. As the environment changes the schools must change to meet it, if they are to do the work for which they are intended. If our schools had been less efficient in the past there would be less difficulty to-day in adapting them to present needs. Some one has said "Man must be fluid, must be able to change, institutions are not fluid, they never change until forced to do so and then they fight to the death to maintain their dogmas." While this is to some extent true this very conservation is one of the strong points of the public schools. It is well that they are not carried away by every dreamer with a freak educational system. Nevertheless certain changes, not reforms, are needed if the country schools are to adapt their pupils to farm life. By country schools we mean not only the one room country schools but the township high schools as well.

That it is the function of these schools to adapt their pupils for farm life should not be questioned. Practically all their pupils come from the farm and most of them will continue on the farm. Very few of them will attend any other school and must therefor get whatever education schools can give them in these schools. It should be the function of the schools to train the pupils for the conditions of tomorrow so far as they can be foreseen, but since the morrow cannot be seen let us train them for to-day rather than for yesterday.

The specific adverse criticisms made of the country schools are that they do not touch the heart of the community, that they are modeled too much after city schools, that they do not give enough useful knowledge, and that they are inclined to place the fitting of students to meet college entrance requirements ahead of training for life, that is they are inclined to sacrifice the interests of the majority for the benefit of the few. The reasons of these tendencies are far to seek but the remedy is not always so easy to apply. The leaders in education have not been workers in the rural schools and there has been a constant drainage of the best teachers from the country to the city schools and the professions on account of the better salaries. The country teachers have in general recognized the superiority of the city school and in seeking for improvement have naturally been led to copy. A great deal more thought has been given to the improvement of city schools for city environment because of the better organization and higher salaried men.

The public gives the teacher of the township schools more credit for fitting one student for college than for what he does for all the rest of the school. It is natural therefore that the teacher should give special attention to this one again. The teacher is perhaps a college graduate and would of course like to furnish a new student to his *alma mater*.

In order that the school may touch the heart of the community it must become more of a social center. The games and amusements entered into by the pupils contribute more toward this end than any other one thing. Where you see a school that can get up a ball game you will see one that is getting next to the people.

If we admit that the rural schools are not meeting their possibilities and can point out their specific weaknesses we should then seek the remedies. Some of these have already been suggested, perhaps none of them are new to you. The two great opportunities for improvement are by centralization and consolidation and the introduction of vocational studies. Centralization and consolidation will mean fewer schools so that we can pay better salaries and have better teachers and more close supervision. It will make the school more of a social center, stimulate civic pride, increase attendance, and interest more people. Consolidation and centralization are placed first not because they are regarded as of more importance than vocational studies but because logically they should come first although actually they will come last. It will be a long time before any large per cent. of our country schools will be centralized or consolidated.

Of the vocational studies domestic science is perhaps the most important because practically all girls will become housekeepers sooner or later, most of them sooner, but this is out of my line. The course of study should include domestic science for all the girls and manual training and agriculture for all the boys and some agriculture for the girls. The manual training should be agricultural in its tendency and all exercises should lead to the making of some useful object. The pupil should be able to see some utility in the work without exercising too much of the "substance of things hoped for, the evidence of things not seen." In manual training it may sometimes be necessary to restrain the pupil's ambition, to prevent him from undertaking to make articles too difficult or complicated. Accuracy is probably the most important element here.

Agriculture may be introduced either into the elementary schools, eighth grade and lower, or into the high school. It may be introduced into the elementary schools as a separate subject, in connection with nature study, as supplementary reading, or special phases may be developed by oral teaching object lessons and busy work. While some agricultural work in the elementary schools is desirable it is of less importance than its introduction into the rural high school.

The State of Pennsylvania puts the high school education within the reach of every person within the State who is interested enough to accept the provisions of this law and has the ability to go that far. Agriculture as a separate branch is more of a high school subject than an elementary subject. That is, it can be taught to better advantage in the high school than in the grades. There are many phases that may be taught in the grades but these are better probably taught somewhat after the manner of oral instruction object lessons, etc., rather than as a distinct subject. In the high school too there is more time for the introduction of vocational subjects, and teachers are better prepared to teach them. Further the high school course without agriculture tends to separate the pupil more and more from home interests. This is not so much the case with elementary schools. The object however is not primarily to keep boys on the farm but to broaden the pupil and put him into sympathetic and intelligent relations with his surroundings. If in doing this it makes farm life more pleasant and more profitable and thus induces a larger number of the bright boys to become farmers, it is well.

There are three ways in which agriculture may be introduced into the high school. The first is by the organization of distinct Agricultural High Schools whose primary function is to make farmers or in other words to teach agriculture as a specialty in an agricultural environment. The second is the introduction of an agricultural course into our existing high schools parallel with the other three years' or four years' coursed now being given. In these courses some agricultural subjects will be taught each term from the beginning to the end of the course. The third method is the introduction of the subject of agriculture as one of the sciences in the regular high school course, coordinate with botany, physics, and other sciences now taught.

We believe that the last named method is by far the most important and the most practicable one. We believe that the subject should be taught in the existing high schools rather than in special high schools for the reason that the State would hardly feel able to support two sets of high schools in the manner in which they should be supported to do the work well· Another reason is that these special high schools would necessarily be few in number and so far apart that they would be readily accessible to only a few of those which they would be intended to reach. A further reason is that special schools would foster the class feeling and tend to sharpen the line separating the rural from the urban classes, which is contrary to the spirit of American institutions. We believe that so far as practical the farmer should be educated along side of the lawyer, the merchant and the engineer; in the same classes as far as possible. A few special agricultural high schools would be a good thing but they should supplement rather than take the place in existing high schools.

We believe that it is more important that agriculture be taught as a branch coordinate with other sciences rather than that special agricultural courses be organized for the reason that a greater number of pupils would be reached as most of the rural high schools are not able to maintain more than one course of study. We believe that it should be required of all as its training value aside from its utility is fully as great as that of any other science. It requires as close observation and as accurate thinking as any of them. It may be the first science taught when it will serve as an introduction to the others, or it may come after physical geography and botany.

A few months ago we sent inquiries to all of the county superintendents in Pennsylvania asking for a list of the high schools of the first, second and third classes in each county teaching agriculture. Replies were received from 43 superintendents representing 85 high schools of the first class, 154 of the second class, 290 of the third, and 29 unclassified, or a total of 558 in all. These superintendents reported in the 43 counties there were 12 high schools of the first class, 36 of the second class and 107 of the third class making a total of 155 in which agriculture was being taught. Letters of inquiry were then sent to each of these 155 high schools asking the number of years in the course, the extent to which agriculture was taught, the text-book used, if any, and the proportion of time given to recitations and to practicum. Replies were received from 89 principals. Of these 53 reported that they were teaching agriculture, nine reported that it was being taught incidentally along with physical geography or some other branch, and three that it was optional in the course but was not being taken. Two schools reported separate agricultural courses. Most of them however seem to devote about one period per day for half a school year to the subject. A few teach it two or three times a week for half a year.

Twenty-six or exactly half of the schools were using a text-book which is not above the eighth grade. Nine more were using a book that is even more elementary. Both of these are attractive books and are put out by very aggressive publishing houses which accounts for their wide introduction. Six schools were using Warren's Elements of Agriculture which is probably the best book we have for the purpose at present. Two were using Wilkinson's "Practical Agriculture" which may be made of high school rank if the teacher so chooses. Within the last month or two Halligan's "Fundamentals of Agriculture" has appeared which is also a high school book but better adapted to southern conditions and does not contain directions for laboratory and field work.

Most of the schools devote nearly all of their time to recitation giving very little to demonstrations, field or laboratory work. They give as the reason for this when asked that they do not have time for anything else. To my mind three recitations per week and two periods given to demonstrations or practicum work of some kind are desirable. It would be well to have double periods for practicum work, if possible, but even single periods would be better than giving all the time to recitations. The pupil must use his hands and eyes if he is to get the desired amount of training from the subject he cannot get it by using his memory alone. The pupil must be taught to see and do things. These inquiries show that agriculture is coming into the schools and it is our business now to see that it comes in the proper way. If we introduce merely a text-book in agriculture the result is apt to be disappointing and there is danger of a reaction. If we introduce work of too low a grade it will be disappointing. If the pupil sees in the work only things that he already knows, even if he sees them in a new light he is not getting all he is entitled to. Not only must we teach agriculture but we must teach it right, the pupil must feel that he is getting something worth while.

In teaching agriculture in the public schools we must seek to accomplish the following:

1. Give the pupil new knowledge.
2. Develop the view of the knowledge he already has.
3. Teach him to use his thinking faculities.
4. Teach him to do things.
5. Teach him to find out things for himself.
6. Correlate the school with the home life.
7. Not neglect the business side of agriculture.

While we realize that rural life problem is a large one and that the country schools are only part of it, we believe that the teaching of agriculture in these schools, as it is capable of being taught, will do more than any other one thing for the advancement of the rural community and the conservation of our natural resources.

The CHAIRMAN: We will now have the address by Prof. Clinton, on "The Present Trend of Agricultural Education."

I have the pleasure of introducing to you Prof. Clinton.

Prof. Clinton then delivered his address as follows:

THE PRESENT TREND OF AGRICULTURAL EDUCATION.

By L. A. CLINTON, *Storrs, Conn.*

When I selected my subject for the address at this meeting I had no knowledge of what the other subjects were upon the program. The large number of addresses upon the subject of agricultural education simply shows the importance of that subject and the large place it is occupying in public education at the present time.

There seems to be a general interest in the welfare of the farmer, and the strange thing about it is that the least interest of his welfare is being shown by the farmer himself. City people, college professors, railroad presidents, boards of trade, have all become interested in the welfare of the poor farmer. Meanwhile the farmer pursues the even tenor of his way, plants his crops, fights the bugs, harvests crops, sells his products and gets about thirty-five cents of the consumer's dollar paid for the same.

In every age and in every generation there are those who are inclined to look with more or less sympathy, pity or scorn upon the customs of the previous generation or age, the belief apparently being that we in our wisdom have made great progress over those who immediately preceded us. On the other hand there will always be those who are constantly living in the past. It was the "good old times," whether in religious life, or educational affairs or business. In spite of all trusts and combinations in restraint of trade there are none of us who would go back to the time of the home industry, when everything necessary in the way of wearing apparel, food products and furnishings for the house was made on the farm. While we may lament the present disregard of the Sabbath, there are none who would wish for a revival of the old manner of Sunday observance.

Schools and educational methods have also changed, and while there are some who regret the passing of the classical scholar and recognize as an educated man only one who has been trained in the classics, yet the majority of people have come to recognize that the old system of education has had its day, and that what is needed at the present time is an education which will fit the boys and girls for the practical work of life. New schools and new methods have come to stay until they shall become antiquated, and possibly the future generation will think of our age with pity, possibly with scorn, that we so slightly grasped the problem. The methods of every age are an outgrowth or development from preceding ages. Some of the best from every age is preserved, modified and developed to meet changing needs and new conditions. In this forward march there must always be some back tracking, some mistaken notions as to what is best to preserve, but the general trend is forward in the solution of the problems of life.

One of the most remarkable trends at the present time is towards agricultural education, not only of the farmers but of the masses, city people as well as country, and this general interest has been largely created within the last few years. When the agricultural colleges were being established some fifty years ago there was no general agricultural awakening and no widespread interest in agriculture. The earliest attempts at agricultural schools were failures because the people were not especially interested. The masses of the people were producers and not consumers and the amount of product which was being produced each year was great enough to more than supply the demand for these products at reasonable prices. The importance of the federal law which resulted in establishing agricultural colleges in every state was not fully appreciated for about two generations after its enactment. At first there were but a few students and few teachers and but little to teach. There was no agricultural science, and while the men who were called to positions in agricultural colleges did noble missionary work yet their training was almost entirely from the practical side. This was necessarily so because there was little or no agricultural literature; there was little in the way of definite facts relating to agriculture; there was no problem of food supply for the working masses. In most of the states the agricultural colleges were located as separate institutions and not combined with the state university. The reason for this was because it was feared that the students in agriculture would be looked down upon by the other students; that to be known as a student of agriculture in a great university would be rather a disgrace, and that those who might wish to take the agricultural work would become lonesome and shift over into the other courses of the university. But in a few of the states the agricultural college was combined with the state university, and in most cases where this was done the agricultural college has now become the big college of the institution and the students are proud to be known as students of agriculture. City men as well as farm boys are registering for the courses and agriculture is now the popular thing. When the agricultural colleges were established it was expected that they would have a marked effect upon the farming industry. They were to bring about an educated country population; they were to result in the conservation of our agricultural resources, and through them was an attractive country life to be made possible. These hopes were not realized, and it was soon found that if agricultural education was to be developed there must be some foundation of agriculture science. This resulted in the federal law establishing agricultural experiment stations in all of the states, and in those states where experiment stations had not already been established it was required that the experiment station should be established in connection with the agricultural college.

The work of these experiment stations has become the greatest factor in agricultural education in our day. They have made possible a science of agriculture; they have established the basis for work of our agricultural colleges. In many cases the man who is working quietly in his laboratory day after day, month after month, and year after year may be the man to whom we are indebted for the most important results in relation to agriculture. The man who attracts the attention may be the successful teacher or lecturer; he may be the man who can most successfully organize farmers' institute trade, in other words the most successful advertiser. If our work in agricultural education in this country is to be developed this will come about only through the increased support and development of our agricultural experiment stations; in careful scientific work of the investigator is necessary as a basis for instruction in the class-room. Therefore it is important that every state shall see that its agricultural experiment station is liberally supported; that the investigators are given unlimited opportunity for research work because much as we have accomplished we are just at the threshold of agricultural science.

While there is no question about the great value which resulted from the early work of the agricultural colleges yet the results were in a direction entirely unlooked for by those who were responsible for the colleges. The graduates of the college became teachers, experiment station workers, lecturers, scientific investigators in the U. S. Department of Agriculture; they even became lawyers, doctors, and occasionally a preacher was developed, but not many of them became farmers. The reason for this was that the trained men, graduates of the agricultural colleges, could do better financially elsewhere than they could on the farm. Naturally, then, they drifted into other lines of work. Those who did return to the farm, however, showed the value of the training they had received, better methods of agriculture were put into practice; and their farming methods became models for the community. Almost until the present time the agricultural colleges have continued giving a thoroughly scientific education, and while this work must be continued yet there is another growing demand at the present time, and this demand is for the popularizing of agriculture education. I would not in any way under-estimate the importance of the work which has been done by our agricultural colleges because their graduates have become leaders in every walk of life, and it was owing to the great demand for men in agricultural experiment station work and in scientific investigation of every kind that these graduates did not go back to the farm, but their work has been of direct value in promoting the interests of farm life through their application of scientific principles to the problems of the farm. There was no popular demand for the agricultural colleges to in any way change their courses of instruction or to render their work more popular. In fact the masses of people cared very little what the agricultural colleges were doing anyway, but when the price of food products began to soar beyond reach of the average consumer, and the wages received by the workmen at the end of the week were barely sufficient to pay the bills for food products which had accumulated during that week—then came the demand for a more general dissemination of agricultural information for the teaching of agriculture in the public schools. Then our great railroad corporations became interested in better farming trains, in model farms, in all that would in any way develop farm life without interfering with the price they received for the transportation of farm products. The settlement of all our arable lands, leaving no further room for expansion westward has brought about a demand for more intensive tillage of the lands which are now under cultivation. Higher production per acre must come at once if relief is to be found for the high cost of farm products. The partial depopulation of many of our rural communities has been brought about not because of unfertile soil but simply because better opportunities have been offered elsewhere, and the farming population, like people in every walk of life, have accepted the opportunity offered them even though it necessitated leaving the farm.

The most constant and ever present demand of the human race is for food. So long as the supply is plentiful no one pays any special attention to the source from which it comes or the conditions under which it is produced so long as the product itself is in fair condition. The trouble with agricultural science and its relation to the farmer has been that there has practically been no relationship between the two. The colleges and experiment stations have gone forward with their work. A comparatively few well trained men have been developed and these men have gone into various lines of work, and the individual farmer working back over the hills has for the most part been left to work out his problems as best he might. The other day in looking out of my office window, I saw Copeland driving his ox team, walking along before them, swinging his ox whip and calling to them. He was expecting them to follow. At one time he walked so far ahead of them, expecting they were close at his heels that they apparently lost sight of his leadership and began to graze by the roadside. After walking on for some distance he swung his ox whip over his shoulder and called to them to come on, and upon looking around was surprised to see that they were far in the rear and paying no attention to his directions. This, to me, illustrates fairly well what has happened in the agricultural world. The colleges and experiment stations have gone forward with their work, expecting the farmer to follow, but he has been left far behind until he has really lost sight of the work which has been done for his benefit. While I know there are exceptional cases, and a large number of exceptions of individual farmers who have made progress and who are applying to their work the very latest and best methods known, yet farmers as a class have failed to apply the latest principles which have been worked out by our investigators. We must go back to them and keep our leadership closer to the individual farmer. We have learned that the agricultural science will not feed the hungry people of our land unless it is actually and practically applied to the production of food crops on the farm. The educational pendulum is now swinging rapidly towards the other extreme. The demand is being made that agriculture shall be taught everywhere and by everybody.

Vocational training is demanded as a part of our regular school system and in separate schools of agriculture and agricultural high schools. Agricultural education is now being given to the masses through farmers' institutes; through better farm trains; by the "schooner" wagons which go out across the country, carrying charts and illustrative material to the individual farm; by the introduction of agricultural courses in the public school; by the agricultural high schools as separate institutions; by the agricultural colleges, not only through their regular four year courses, which lead to a degree, but by their schools of agriculture; their special courses and by extension work and demonstration experiments; by experiment station bulletins; the agricultural press; by the popular monthly and weekly magazine; through the daily newspapers, and even from the pulpit of our churches as well as by the organized bureaus of the state and national government. This all means that the effort is being made at the present time to reach the individual farmer. We have been considering farmers in the mass; we must now pay more attention to him as an individual and there must be a constantly increasing effort to reach the individual farmer and help him to solve his problems.

The difficulties which are being met with in this popularizing of agricultural education are the facts that agriculture is a peculiarly technical study, and that it requires trained teachers in order to properly give the instruction, and these trained teachers are difficult to find for the money which is available as salaries. This teaching requires not a mere statement of facts which relate to farm life, but a thorough discussion of the principles which underly these facts. Conditions may change, but where the principles are thoroughly understood the farmer should be able to apply them. This work requires time, industry and patience and while our short courses in agriculture, and the various other methods which have been adopted for the dissemination of agricultural information are doing a splendid work and will result in great improvement in farm life, yet the problem is only partially solved through these means. Thorough mental training is required for the successful pursuit of farming as an industry just as well as in any other walk of life. There is no occupation in which more problems are arising every day which must be solved upon the spot, and upon the correct solution of which depends success or failure, than in farm life.

There is no country which has a more highly developed agriculture than Denmark, and centered all over that country, within easy reach of the farm boy, is the rural high school. The boys who go to these schools are given not short courses in agriculture, but general training courses; work which is designed to develop their reasoning powers. These boys go back to the farms, better able to continue their work successfully, not because they have learned a mass of facts, which sometimes apply and sometimes do not, but because they have learned to think and to reason, and in thus learning they are better able to solve the problems of the farm than they were before.

The strenuous demand which has been made for purely informational courses has forced somewhat the hands of our agricultural colleges, and yet the real leaders in agriculture are going to be found among the best trained men who have taken the longest and most thorough courses offered in college training. Just what should be the relationship of our public school system to agriculture is a much debated question at the present time. There are some enthusiasts who would have the immediate introduction of agriculture in all the public schools; who would have the teachers without any special training or preparation begin giving instruction in agriculture. This in my opinion would be a great mistake. To properly teach any subject requires a pretty definite knowledge of that subject on the part of the teacher. This knowledge of agriculture is not possessed at the present time by any considerable number of teachers in our public schools, and it cannot be acquired upon short notice. I believe the time is not far distant when agriculture will be made a part of the instruction in all of our public schools, city as well as country, but the work will be given by teachers who have been especially trained in agriculture science. This work will not be given because of vocational value, but because agriculture possesses peculiar value as a training subject. It is just as important that agriculture should be taught in our city schools as in our country schools. It is important that the consumer shall know something of the conditions under which farm products are produced. Many of our city people do not know what good milk is when they get it, neither do they know how to care for this milk until it is consumed. More knowledge on the part of the city people with reference to the difficulties in the production of the food products would create a broader sympathy and a more general interest in farming conditions and would result in great benefit to the farmer. This work in agriculture should be given in the higher grades and opportunities should be given to those who wish to specialize along agricultural lines, to take advanced work in that subject.

The highest degree of success in any farm community will not come through a knowledge of agriculture alone. This knowledge may result in the making of money, and when the money has been made the farmer moves to the city and a tenant comes upon the farm. The trouble here is that the social life of the community has not been developed and the farmer has not been trained so that he can see the beauty and opportunity and the advantages of the open country life. He looks upon the farm as a place to make money and so it is, but there should also be an opportunity for the enjoyment of that money to its fullest extent without moving from the farm.

One boy in my class in Rural Economics offered as an objection to farm life the fact that the best girls do not wish to marry a fellow who is going to live on a farm. Of course, the other fellows of the class immediately asked him how he knew. But if that objection is really true then the subject is worthy of the most careful investigation to find out why it is true. I believe if the young man who is living on the farm possesses that degree of culture, of training and of mastery of his business which is possessed by the most successful man in other walks of life that the best girls will not object to life on the farm. If on the other hand the farmer is lacking in training and in general culture and he sees in his farm and in farm life only an opportunity for making money, then who would blame the best girls for objecting to marrying a farmer. Improvement in the farm life in any community must come from sources acting within that community and not from without. These centers of crystallization from which will radiate the elevating influence will be the farms of those who have received the most thorough training in our schools or colleges of agriculture.

Much valuable printer's ink has been used in recent times in discussing methods for the uplifting of the farmer. In my section of New England we have a native dweller upon the soil by the name of "Harvey." In our local discussions with reference to methods of improving farm life one of my colleagues has always replied to my propositions, "Go try it on Harvey." If you can uplift him then there is some value in your proposition." It seems to me the problem of country life in every section is how we are going to reach the "Harveys." In the first place they do not care to be reached; in the second place we have no point of contact with them. The one way that I can see to reach them is through the location in every community of men whose farms will become model farms; who will take an active interest in the improvement of church, schools and roads and all of the social conditions which make for the advancement of that community. Just as in city life the community settlement has been found to be one of the most potent factors towards improving conditions so the community settlement in country life will be found one of the most powerful factors towards improving local conditions.

The farm boys and girls are entitled to an opportunity for securing just as good an education as is within reach of the city boy or girl. At the present time this opportunity is not available. There will be no satisfactory solution of the country life problem until this condition is remedied. Twenty years ago if anyone had said that the farmer in nearly every section of our country would have his mail delivered at his door at least once every day he would have been called a dreamer, and yet at the present time the arrival of the morning paper and of the daily mail has become one of the mixed features of farm life. The next great step forward will be the organization of the township rural high school, as thoroughly graded and as thoroughly equipped as is the city high school;—the development and the training of the country boys and girls in the country, not necessarily in agriculture, but under their natural surroundings in which they will be taught to see something of the beauty of country life; something of the possibilities of the farm. Through this will come the development of our rural life.; the improvements of social conditions and the establishment of better relations, and more thorough understanding between our country and city population.

DEPUTY SECRETARY MARTIN: What objection would you offer to the introduction of an arithmetic in the common schools that used for illustration and demonstration lessons in rations, feeding, fertilizers and other conditions of that kind?

PROF. CLINTON: None. Good thing. It is a good thing, and if the teacher does not have the arithmetic with these problems in it I would have this teacher make up these problems and give to the classes. The teacher should not depend on the book for these problems.

DEPUTY SECRETARY MARTIN: You think it would be a good kind of arithmetic for country schools?

PROF. CLINTON: Splendid. I do not see why they should not work on percentage with reference to fertilizers and rations. I had a boy come to me the other day. He was a graduate of college and he had worked in public schools, and he said: "I really never learned percentage until you got me to figure the percentages of nitrogen and phosphoric acid and potash and found I had learned it and now I do that figuring for all the farmers in my neighborhood."

A Member: What about geography? We have text books on geography. Should they illustrate our home State with reference to soils and altitude?

PROF. CLINTON: Perfectly well; and with reference to corn, potatoes and commerce and the order in which these agricultural products enter into commerce. There is no text book published better than the text book that picks out the meat, the kernels and draws the class out and instructs them without knowing they are being taught agriculture.

MR. BRONG: It is a general rule that all our text books are based perhaps on commercial life; that is, the text books that enter our public schools, as well as the state schools. I say not only the arithmetic, but all of them tend to train boys and girls away from the farm.

PROF. CLINTON: I think so; and then too they have city life as well as country life. City people know almost nothing about conditions of country life. The great trouble over the milk problem—I happened to pick up a Philadelphia morning paper and the first page is given up to that milk controversy. The city people don't know the conditions under which milk is produced. Night before last a man getting good milk said: "What damnable milk I am getting." He said: "It is worse than skim milk." I said: "You don't know what good milk is." Yesterday morning I took a bottle he left out to the laboratory and the Babcock test made 4½ butter fat, and the man said it was no good. He expected the cream to be half way down the bottom of the bottle and because it was not he said the milk was no good. A milkman said a customer said to him "This milk has a thick yellow scum on the top of it." And she did not like it. One man finding fault because it did not have the scum and one woman finding fault because it did have the scum.

MRS. MONROE: Is there any objection to pupils of schools knowing that they are being taught agriculture, and what is the objection?

PROF. CLINTON: Well, one teacher said to me: "If we are going to teach agriculture, just where shall we begin, just what shall we call agriculture; and just what shall we call science in its relation to agriculture." One man reads a paper at a meeting and says we are learning too much about sciences which relate to agriculture and too little agriculture. So I wrote to the man and I said: "Will you please just define to me what you mean by the things which are about agriculture and how they differ from the things which relate to agriculture,'" and I never got any answer to my letter because agriculture embraces all these sciences. There is chemistry in its relation to agriculture; soil physics; physics, and I do not know but what astronomy enters in very much. All these are sciences in relation to agriculture.

Yes, I would have them. And look what that means on the part of the teacher that you are going to have teach all those things. Is it better she should do the things she knows about and do them well or have her smattering all over the subject of country life and do it only partially well?

MR. J. ALDUS HERR: What is your opinion of the Congressional agricultural schools in districts as in Wisconsin, in reference to teaching the boy agriculture on the farm? Having the object before him?

PROF. CLINTON: My opinion about teaching agriculture in the schools is this: That when it comes to rural schools it is going to require teachers trained in this subject. What I object to is every teacher teaching reading and spelling and geography and everything else is also going to be required to add agriculture to her list of studies. Out in Wisconsin where they are taking up the work they are putting trained teachers in those schools and that I agree with. But when agriculture comes with the greatest success in Pennsylvania or New York or any state it is going to be because the teacher has been especially trained along these certain lines and then the work is going to be given as it ought and we are going to leave the other teacher teach what she has been prepared to teach; and this teacher of agriculture, it may be of a consolidated school, it may be an itinerant superintendent going from school to school, as I saw who has boys growing potatoes and corn and studying those plants as no children in these schools have ever studied them before; not leaving it to every teacher here and there, but taking charge of it himself, and he is trained in that line. When it comes the way it is coming in Wisconsin with the agricultural high schools or agriculture in the high school, with trained teachers in charge of it, then I say let it come and it cannot come too soon when it comes that way.

MR. J. ALDUS HERR: The reason I asked that is that Lancaster county is a Congressional district. We have a very good trolley system. If we would have a Congressional agricultural school in our midst, adjoining us we have a couple hundred acre poor farm where they could do experimenting and many of the boys could come here and get information and work on the farm and at evening go home and be under parental care.

PROF. CLINTON: Now when you get your school you are going to send to State College and say: "We want your best men to come to take charge of this school, and we want men there who have training along certain lines and can give us the best instruction in agriculture that can be given." Good, good. That is the way to get it and when you get it that way it is right. But when you get in every little school in the country it is the exceptional teacher, the rare teacher you find here and there who can give them the instruction in agriculture and really make anything of it.

I was talking at a farmers' institute and when I got through a school marm came over and said: "I am teaching agriculture in my school and teaching it successfully." I said: "I am glad to know it." I said: "Where were you trained in agriculture?" She said: "I had the three months' course in agriculture at the New Brittain Normal School." I did not discuss the subject with her any further and I did not tell her what I really thought about her knowledge of agriculture. It was not safe.

MR. PEACHEY: How long then shall we wait to get that teacher to teach agriculture as you would have him teach?

PROF. CLINTON: I would have our normal schools begin giving instruction the first year of entering, begin the first year's normal school work and have it go through ever year of the normal school course and just as fully as possible. I would have these create enthusiasm for farm life that there would be no law requiring them to teach agriculture. They would do it any way because they were interested and knew something about it.

MR. PEACHEY: I wish we could send you to the Pennsylvania Normal Schools. They need a missionary.

PROF. CLINTON: I was attending a school meeting of the people who live in a certain country school district. We were having a conference with the town school board and the secretary of that board was telling how difficult it was to get teachers for their country schools. He says: "Not a normal school in this State which trains teachers with any idea of going into the country schools." I said: "If that is so the normal schools of Connecticut ought to be reformed right away."

MISS THOMAS: Whose mission is it to reform them and whose mission to institute these agricultural schools?

PROF. CLINTON: Well, if we leave that for somebody else to do; if we each one leave it for somebody else to do, it never will be done. In every state I believe we have boards of education. In Connecticut we have a secretary of the board of education who is responsible for the control and direction of these normal schools. Now everyone who is interested ought just to shower that secretary with letters protesting against the course of study in normal schools and lack of attention to country schools. Our parents of the children who live in the country ought to appeal to that secretary to see that the graduates of these normal schools, some of them, are fitted for life, to teach in the country and not all of them for the city. It is for every man and woman here who is interested in the country to bring that about.

A Member: I would like to know how you are going to get these competent teachers unless you begin with them when boys and girls?

PROF. CLINTON: Why, we are getting them. Do you know anything about the number of students at your State College?

A Member: I don't know exactly.

PROF. CLINTON: It is large. A letter from the agricultural college this week says the students are pouring in on us; we must limit the number; we cannot take care of all of them with the maintenance appropriation. The colleges are training not only men but women who are going to take up this work, and requests are coming from schools all over the country. I never had so many letters as this spring; from as far west as Minnesota; "Have you got men trained along certain agricultural lines who can come to begin the teaching of agricultural schools?" There is where you are going to get your men; and the agricultural colleges and normal schools as well are going to train these men and women for you.

A Member: There is no question there is a lot of young men and young women that cannot attend the inexpensive schools, at our normal schools. Shall they have no training in these lines at all?

PROF. CLINTON: I would rather they would have no training at all along these lines than to have some of the training that I have seen given along these lines. I would rather they would have none. Now then if we can find the teacher who can give that training well and good, but if they cannot give it and give it properly, it is better not given at all. The teacher that takes a book and says: "The lesson to-morrow is the next five pages:" is no teacher to be teaching agriculture in your schools.

MR. BAYARD: The trouble is when you do have these teachers you don't pay them enough. You cannot hire an agricultural college graduate to teach in the public schools. I hired two agricultural graduates last year but these two graduates have got so valuable that I could not hold them.

PROF. CLINTON: When they get so that they can teach agriculture they are worth more.

MR. BAYARD: Yes sir; more than in public schools.

PROF. CLINTON: Then put several public schools together and at the head of the agricultural work in that combined public school have a teacher in agriculture.

MR. BAYARD: That is the only way possible here.

PROF. CLINTON: We cannot do it. You must not expect to do it. But if you combine these schools you have a chance.

MR. BAYARD: That is right; but here we have a condition that confronts us. Take the State of Ohio. They passed a law this winter and are going to put agriculture in all their public schools and they are not ready for it. That bill was shoved through. I don't know if that could be done in the Pennsylvania legislature. We want to have our schools endowed before we start to teach agriculture in them. We cannot expect the teachers. They cannot afford to do it. It costs to become an agricultural teacher.

PROF. CLINTON: Showing that the work of Pennsylvania State College is valuable.

MR. JOEL HERR: I would like you to state the proportion of agricultural students there are now compared with what they have been in recent years, to know what condition our college is in.

MR. BAYARD: There are something over 630 in agriculture at the present time in the Pennsylvania State College. There are 1800 students at State College to-day and 630 are in agriculture.

PROF. CLINTON: And these men would be willing to take positions as teachers of agriculture, I think in these consolidated schools.

MR. BAYARD: Yes, but not go back into the country school work.

PROF. CLINTON: No; you must not expect these men with experience at seven to twelve dollars a week.

MR· BAYARD: They cannot do it. It costs too much to get the education. It is worth too much.

MISS THOMAS: Mr. Chairman, there seems one place to me that we could help this whole question and that is by devoting one session of the institution to the discussion of this question from a local standpoint and to educate the people in the local communities to arouse their thought along these lines and to see to it that they have the right connection between themselves and the Superintendent of Education and the Board of Education of our State. And I would also like to take exception to the statement of the previous speaker when he gave his definition of education. I may be wrong but it seems to me that it is a dangerous definition without any modification, because education should develop a better environment. I should like to ask Prof. Mairs how he could apply his definition to the children of the small sections of our State, or where we have bad environment in rural schools as we sometimes do.

PROF. MAIRS: We adopt it to the environment. We mean that we change that environment, and make an environment. We do do not want to continue that environment. That is what I meant.

MISS THOMAS: I think you better modify your definition.

PROF. MAIRS: I will take that into careful consideration.

The CHAIRMAN: We have a few moments left. Is Mr. Kester present now? He is and we will go on with the program. I now have the pleasure of introducing to you Mr. Kester who will speak to you on "Some Lessons we Should Teach·"

MR. KESTER: I wish to apologize to the Chairman and this audience for being late this morning. But fifteen minutes ago I was in bed. I have spent the last two nights on the Pennsylvania Railroad, being called to the western part of Pennsylvania to attend a funeral and laid down on my return this morning for a few minutes rest. Then the porter got busy and forgot me and I forgot to get up. I can, however, tell you about all I know in about twelve minutes and leave you out in time for dinner.

My paper and its contents may be a little out of line with the thoughts so far this morning in as much as the previous subjects, as I take it, and no doubt the previous discussion has been along the line of the rural school's work entirely. My subject applies not so much to the teachers of the public schools as to what they should teach, but to us as men and women who presume to teach the fathers and mothers of this land agriculture.

Mr. Kester then presented his paper as follows:

SOME LESSONS WE SHOULD TEACH.

By R. P. KESTER, *Grampian, Pa.*

I do not expect to present anything new this morning, anything that has not been advocated by at least some of our institute speakers in the past, but realizing that some men think the only legitimate field of the institute worker is to teach how to increase production—how to make more money, I wish to call our attention to some other phases of the farmer's life that needs his increased attention and activities quite as much as that.

There is no question but what first and foremost of the practical questions is how to naturally and most cheaply maintain and increase the fertility of the land. Need of this knowledge is evident from the fact that the average farm produces little, if any, more than it did in the days of our grand-fathers. For many years much has been said and written on the subject and many bulletins published by our experiment stations giving the results of their findings, and all of this has been said and written on the subject and many bulletins published by our experiment stations giving the results of their findings, and all of this has been suggestive and useful, yet a great deal of it seems to be in the nature of temporary expedients and have not solved the problem of building up permanently and economically a productive soil. Instead of figuring so much about pounds and percentages of potash, phosphoric acid and nitrogen as purchased in the fertilizer sack, for which so great a part of the crop's value is paid, the general farmer demands and needs to know of natural methods by which he can maintain and increase his fertility and have profit at the end of the year. A few families have been doing this for years, many of them in this beautiful county of Lancaster, and in almost all the instances I have examined, the four C's—corn, cattle, clover and cultivation—have been the four corner-stones of success. These four agencies, intelligently handled, will bring success to any general farmer.

I do not wish to belittle outside agencies, but I do want to protest, to those who attempt to teach lessons on fertility, against unduly emphasizing the necessity of hauling material from the ends of the earth to put on the land, but to teach such methods and practices as will enable the general farmer to regain, maintain and increase the productive power of his land.

Another important lesson in need of emphasis by teachers is that the farmer must specialize more than he has in the past. In the olden days when every farm was a little kingdom, independent within itself, when practically all that the farmer and his family used was produced and manufactured on the farm, the crops and rotation of that day were suited to the needs. But farmers no longer make their tools, harness, boots and shoes, soap and candles; the whir of the spinning wheel and the pounding of the loom are no longer heard in the farm home, but instead all these things are purchased necessitating the expenditure of money, the equivalent of labor or its products and the farmer who has no speciality has little to exchange for the necessities he does not produce· Farmers have been slow to adapt themselves to the changed conditions; slow to realize that he can't live the individualistic life of his grandfathers, but that he is part of a larger and more complex life where he must exchange the value of the products he has for those he does not have. He too often sticks to the crops and rotation of a former day, raising a little of everything, just enough for home use, and does not have a money crop—does not have a specialty that he may exchange for the thousand and one things required in the modern home. So we need to teach the necessity of a specialty on every farm, one suited to the man, the soil and the market. And this not as an individual, but as a community. Every community of farmers would be benefited by meeting and planning together as though their farms were one big farm and they were joint owners. In the future, crops will be raised and sold co-operatively. You say this is visionary? Maybe it is but it is in line with modern business methods. It is one of the necessities in bringing closer together the producer and the consumer, one of the most important questions confronting us. Buyers are attracted to a community where there is produced an abundance of fine fruit, or a good breed of cattle. A community noted for its good butter or its fine poultry can sell to a better advantage. In all such cases, sales are more easily made and better prices are obtained. A study of the soil, climate, water and markets should be made and the specialty selected which is best adapted to them. Farmers would find as much opportunity for applying the much-talked-of methods of "scientific management" as do the captains of other industries.

These things emphasize another important question, the need of organization among farmers. Neither the individual life nor the community life is as useful or as strong when the individual stands alone as when all are working intelligently and harmoniously together. Farmers and their families need meet together, to talk together; to discuss social, economic and political questions effecting them to the end that they may intelligently and concertedly meet the duties of citizenship resting upon them. In this way he loses the fear to think and act independently. The events of the past few months have shown the intelligent farmer that there is no such thing any more as a "stand-patter." Even the professional politicians, regardless of party, have joined hands to further legislation which we believe to be detrimental to the best interests of American agriculture. Only the organized farmers are effective in the fight for fair treatment and a square deal.

There is a growing dissatisfaction amongst country people with the curriculum and the product of the country school. With all the clash and jangle over the new school code, little or nothing has been done to meet the needs of the rural schools. Nearly all the attention both of the commission and the legislators has been directed to the cities. This is partly due to the fact that no concerted, popular demand was made by rural people. We have not agreed as to what we want and brought it forcibly to the attention of the authorities. It is time we stop pretending that we believe a proper school course is one scheduled to begin with the primary school and ending with a college degree. However desirable it might be, we find it to be impracticable. An investigation conducted by the Sage Foundation recently, shows that out of 18 children in the First Grade Grammar school, only five reach the eighth grade and only one the High School. In the rural districts alone the proportion is much less. With all our anxiety about the young people leaving the farm, fully 90 per cent. of them remain in the country, and all the education they ever get is in the inefficient country school. Like all other questions of rural uplift and rural progress, improvement of the rural schools must originate in and be made by the rural people themselves. So it is the duty of competent teachers and speakers to lead in the demand and recommendations of such changes as will bring to the country child advantages for an education that will fit him for his life's work and make of him a contented and efficient man. For fear that we might "consign him to the farm" by giving him an education suited to his needs, our leaders have, in the past, by an unfitted school curriculum, consigned him to a life of inefficiency and poverty. An education no longer means an equipment enabling one to live without work at the expense of the ignorant, but a real education today means that training of the head and hand and will which fits the student for the fullest and most efficient life. Why then should not rural schools fit rural people for rural life? The necessary increased production of the American farm must come, not from extended acres, for there are few more, but it must come from the present farms more intelligently farmed. The future farmer must know how? and when? and why? better than his father does.

One valuable result of the Institute work, together with other agencies, is that the farmer's respect for his own business has been increased. There are fewer discouraged, complaining pessimists than there were a few years ago. This is mainly due to the fact that his greater knowledge of his business makes him feel more fully that he is, in a measure, master of the situation. As he realizes his blessings and his possibilities, he envies less his city brother; that although his cash receipts may be smaller, he enjoys a thousand things for which his city brother must pay cash.

So this is a lesson we may well continue to teach. The Institute speaker who, while showing up errors and fallacies, fails to leave a message of hope and cheer, who leaves his audience in the gloom and despondency of pessimism, does more harm than good, though he may have the wisdom of a sage on technical agriculture. On the other hand he or she who leaves to a community a renewed faith in itself and its calling, leaves the most helpful lesson that can be taught. President Roberts of McDonald College said in speaking of industrial training, "It is not primarily intended to enable one to raise a bigger steer or bigger ear of corn, but by doing so he may make a better home for a better child." Fellow lecturers, let us think on these things. Man's education is not necessarily completed who knows how to grow big crops and make big profits, but when he knows how to expend these in improving himself, his family, his home and his community. Then only is a man in the fullest sense an ideal farmer. This nation will remain great and increase its greatness only as the innumerable country homes continue to be owned by individual farmers. No lesson we can teach is of greater importance than that of showing the young man the great importance of his getting hold of a piece of land. If that day ever comes in which the agricultural land of this nation is owned by concentrated capital and worked by peasant farmers, as other natural sources have been secured and are worked by wage workers, that day will see the decadence of this nation as a republic and the end of democracy will be at hand.

Let me urge you to leave this injunction with every man. "With all thy getting, get understanding." Men should continually strive to understand. The eternal question "why?" is as important as the question "how?" By this, man learns his relationship to his fellowman and to the great out-of-doors. It enables him to see and to appreciate the wonder and power of the great forces with which he co-operates, and to "Look through Nature up to Nature's God."

Deputy Secretary Martin calls the attention of the audience to the program of the afternoon at this point.

The CHAIRMAN: The time has arrived for adjournment. We will adjourn until 1.30 this afternoon.

Thursday Afternoon, May 25, 1911, 1-30 o'clock.

J. Miles Derr in the Chair.

The CHAIRMAN: Ladies and gentlemen you will please come to order. The first item on our program for this afternoon is, "Common Diseases of Livestock," by Dr. C. J. Marshall, State Veterinarian, Harrisburg, Pa. I now take pleasure in introducing Dr. Marshall to you.

DR. MARSHALL: Ladies and gentlemen, I am very glad this afternoon to be able to meet you people for the first time as your State Veterinarian and probably the first time in any way. I have been assigned the subject of "Common Diseases of Livestock." It is a very large subject and I do not know whether I can handle it in a way that will interest you or not; probably not. In order to know how to discuss such a subject, it will be well to know what kind of diseases you have here, what is bothering you the most in that line, and in that way I may help you out in some way more useful and beneficial. If any of you have any questions you want to ask in reference to diseases, if I don't refer to them in my talk and you will ask the questions, if in my power to answer them I will do so.

Dr. Marshall then presented his paper as follows:

COMMON DISEASES OF LIVESTOCK.

By DR. C. J. MARSHALL, *State Veterinarian, Harrisburg, Pa.*

At the present time most diseases affecting domestic animals are fairly well understood. Many of them may be prevented if proper measures are adopted. The knowledge possessed in reference to prevention and cure of diseases is not as well applied as it should be. It is estimated that $5,000,000 worth of livestock is lost annually in this Commonwealth from diseases that might be prevented if the known, necessary measures were adopted to control them· This is a heavy tax and it should be our duty to prevent the loss of such extravagant sums in every possible way.

In 1792 an appropriation of $250,000 was made by the National government of France to found the first Veterinary School in the world at Lyons. This was deemed necessary in order to devise means for preventing or controling the extensive losses in livestock from diseases that were at that time not well understood. There were no qualified veterinarians. Veterinary medicine was practiced by quacks, charletans and misfits from the medical profession. Millions of dollars worth of livestock were lost annually in all European countries from such diseases. The worst losses were due to such diseases as anthrax, contagious pleuro-pneumonia in cattle, foot-and-mouth disease and rinderpest. Many of you can remember when contagious pleuro-pneumonia in cattle occurred in our own country. It cost our Government $1,500,000 and took but five years to exteriminate it. The last case of this disease seen in the United States was in New Jersey early in the spring of 1892. In some countries it is still prevalent. The recent outbreak of foot-and-mouth disease is familiar to all. These two diseases were exterminated quickly in this country because their great dangers were realized and proper measures were adopted for their suppression.

We have occasional losses every year in Pennsylvania from anthrax, yet it has never proved the pest here that it has and does in other countries. It is usually a fatal disease in most all of our domestic animals as well as in man. While we know no treatment to cure the disease, we do know how to prevent it and protect susceptible animals from its ravages. Rinderpest is one of the worst animal plagues known in cattle. It has probably caused more extensive losses to agriculture than any other one disease. Fortunately we have never had an outbreak of rinderpest in America yet the disease is to be feared. It does occur in other countries, is contagious, the contagion can be carried long distances in food. clothing, hair, hides, etc. It is extremely necessary that our country should have men trained in the mysteries of this and similar uncommon disease, at all times in order that they might be recognized at once if they should appear and the necessary measures adopted for their eradication.

The National and State Government prescribe methods for handling the most important contagious diseases. By enforcing measures for suppressing such dangerous diseases as foot-and-mouth disease, contagious pleuro-pneumonia, rabies, glanders, etc., owners are frequently put to great inconvenience, and in some cases hardships are imposed that are hard to bear. It seems best in such cases that the few should suffer for the protection of the many.

To the uninformed it may appear extravagant or unreasonable for the State and National Government to spend money for Veterinary education and sanitary police measures. When it is realized what vast sums of money are invested in livestock and to what extent our people are dependent upon this industry it will be seen that very little is spent comparatively speaking to protect them from the extensive losses that are entirely possible. Our State spends about $1,000,000 annually for the maintenance of the National Guard and for police protection. The dangers to our livestock industry from animal plagues, contagious and infectious diseases are much greater than the possibilities of war. The nine hundred members of the veterinary profession should be looked upon as so many members of our National Guard. It is the duty of each Commonwealth to see that ample facilities are afforded to educate men for this service. It is very inexpensive when compared with other forms of protection that is afforded our citizens and the monetary value represented. Veterinarians and agriculturalists in general should know the great dangers that exist in this line and be prepared at a moment's warning to meet dangerous contagions or infectious diseases and know how to exterminate them.

The great mysteries surrounding the causes of many infectious diseases have been cleared up in the past fifty years. The true cause of anthrax, which perplexed nations for centuries, was one of the first to be discovered. It is caused by a small organism that belongs to the vegetable kingdom and it is so small that it can be seen only with the microscope. Its life history now is well known. How it is transmitted to animals and from them is no longer a mystery. When a district becomes infected with this organism it may remain and is a source of danger for years.

Among the diseases, the causes of which have been discovered since that of anthrax, might be mentioned tuberculosis, glanders, hog cholera, tetanus or lock jaw, black leg, lumpy jaw in cattle, strangles or colt distemper in horses, fowl cholera, nodular disease in sheep, Texas fever, contagious abortion in cattle, etc. These diseases cannot spring up spontaneously. The specific organisms that produces them is invariably the cause. In most cases no curative measures have been discovered for these diseases and we are nearly as helpless in treating animals so afflicted as we were before Veterinary Schools were organized. We should not be discouraged, however, for much valuable information has been obtained in reference to them. When any such disease occurs we now have means for making a positive diagnosis. This is especially important. One of our states spent thousands of dollars a few years since fighting an outbreak of foot-and-mouth disease and later found that the disease was caused by eating smut on grain and was of very little importance.

Aside from our ability to diagnose or recognize the above named diseases, many other points of importance have been determined in reference to them. In some cases vaccination may be used to prevent them. We also know how to destroy the germs outside of the animal body or how to prevent such disease from spreading from infected areas to animals and man.

Among these diseases against which a satisfactory vaccination has been discovered might be mentioned tetanus or lock jaw, anthrax, blackleg, hog cholera, Texas fever and rabies or hydrophobia. It is hoped that similar measures of prevention may soon be discovered for other incurable diseases.

A large number of the above named diseases is more or less prevalent in our own State. Among them might be mentioned tuberculosis, hog cholera, contagious abortion, rabies, mange in horses, glanders, blackleg and anthrax. Any or all such diseases might be better controlled and some of them exterminated if the knowledge available in reference to them was disseminated among those interested. The sensible, practical solution for the extermination of all such diseases may not be entirely settled; but the State Livestock Sanitary Board stands ready to assist those who apply for assistance and it is earnestly hoped that effectual service may be rendered in all such cases.

The fact that tuberculosis can be eliminated from dairy herds has been demonstrated beyond a doubt. You may consider the present method extravagant, yet there is a question whether it may not be advisable to adopt the apparent extravagant measure and rid your herds of this pest.

The measures for controlling glanders, contagious dysentry in young animals, blackleg, contagious abortion and mange are less expensive and more easily applied. By rigidly enforcing the principles of our present knowledge the losses from such diseases should be very small.

There is another class of common diseases of livestock which causes extensive losses and over which the State has no jurisdiction. The most conspicuous diseases of this class are such familiar conditions as blood poisoning, colic, founder, heat stroke, influenza, pneumonia, bloat in cattle, garget or inflamation of the udder and among parasitic diseases might be mentioned nodular diseases in sheep, tape worm in sheep, lice, hoose or worm bronchitis in calves, gapes in chickens and many other familiar diseases too numerous to mention.

Many such diseases might be prevented if proper attention was given to animals in the way of care, feeding, exercise, rest and sanitary measures in general. They are curable in most cases if the proper form of treatment is adopted before the symptoms have progressed too far.

In some cases the disease is not recognized and proper measures for its cure are not adopted till the patient is past all hope. Too much time is wasted in either waiting for the animals to recover without treatment or some patent medicine, home remedy or that suggested by those not competent to prescribe is given a trial. The time to begin treating sick animals that are in need of treatment is in the beginning and then no medicine should be used unless it is prescribed by one who knows what is wrong with the animal in question and also the dose and effect to be expected from its administration. In most cases the handy dose of medicine does more harm than good. You may say that you have cured many cases of colic in this way. It is a well known fact that many cases of colic will recover if no medicine is given. Colic frequently kills quickly and in spite of the most approved system of treatment. It is, therefore, advisable to look upon colic as a dangerous disease and treat it accordingly.

Cases of blood poisoning usually develop as a result of wound infection. Serious and dangerous forms may develop from apparently insignificant wounds. Nail wounds and wounds from fork tines are especially dangerous and the danger is increased by applying poultices to them. We frequently find such wounds dressed with poultices made of cow manure, flaxseed, wheat bran, etc., and the case in the last stages of lockjaw which may have existed for days but had not been recognized. Lockjaw can be caused in no other way than by the specific germ that is known to produce it, gaining admission in some way to the animals body. It may gain such admission through small wounds from which air is excluded. The animal may be vaccinated any time in a week after such a wound and the disease will not occur. After the disease has developed treatment is nearly hopeless yet occasionally the patient will recover either with or without treatment. It is always advisable to vaccinate animals to prevent this disease when a suspicious wound has been received. The wound should also receive antiseptic treatment.

Horses are often foundered by suddenly checking a perspiration as by giving too much cold water soon after a drive or allowing the horse to stand in a draft when sweating. The disease occurs in a few hours ofter such exposure and if recognized promptly and the proper treatment applied soon enough the case should make a complete recovery in a few days. When such cases are not recognized, are neglected or not properly treated for three or four days or more there is great danger of bad results and the animal may die or is left a cripple for the balance of its life. The best medical attention, if begun late in this disease, will seldom restore such animals to usefulness. All prepared medicines are worthless in treating founder. The best medical attendance should be obtained for such cases and as soon as possible.

The value of a good cow is often materially reduced by a slight case of garget. This disease is usually recognized soon enough but proper treatment is frequently neglected until it is too late. The disease will seldom recover without treatment. It is advisable in most cases where a valuable cow develops this condition to provide a nurse as well as a veterinarian. The case may be cured in the first two or three days if properly treated. After a case has been neglected or improperly treated for a few days the hopes of a cure are slim even though the best form of treatment may be used.

Influenza in horses is not a dangerous disease. Most cases will recover even if no medical attention is given. The greatest danger is due to the fact that it sometimes develops into pneumonia, pleurisy, or some other dangerous complication. These diseases should be recognized early and treatment begun promptly. The average layman can seldom recognize pneumonia or pleurisy even in any stage. Proper treatment begun in the first twenty-four hours after pneumonia develops is of more value in restoring the animal to health than any that might be given for the next week or ten days. There is no specific form of treatment for pneumonia yet if properly treated very few cases should die.

Heavy losses are sustained each year from parasitic disease. Lice are often due to neglect on the part of the attendant yet they are not seldom found on animals that receive the best of attention. The methods for exterminating them are well known and stock owners should not underestimate the damage that is caused by parasites. Whitewash should be freely used in stables, poultry pens. etc., that are infected, manure and filth should be frequently removed. Any of the coal tar preparations may be effectively used. They should not be applied on an animal's skin without being properly reduced. Many animals have been severely burned or even killed by applying such remedies either full strength or too strong.

Gapes occur in young chickens and turkeys. The cause is a small worm that may be found in the throat. Infection takes place by eating or drinking food or water that contains the eggs of the parasite. It can usually be prevented by keeping such young birds on clean board floors till they are a few weeks old. Such floors should be scalded or washed with creolin solution every few days to destroy the parasites, their eggs or larvae.

Sheep suffer most of any of our domestic animals with diseases caused by parasites. Tape worms, stomach worms and nodular disease are very common and when any or all such diseases occur in a flock of sheep the industry of sheep raising cannot be carried on profitably so long as any parasites are present. Such parasites are propagated by eggs. Infection takes place through food and drink. Wet pastures, stagnant pools of water or swamp land is much more dangerous because the eggs and larvae find, in such places, conditions favorable to them. It is well known that sheep do better on high dry land. These diseases are easily recognized because the parasite or its eggs can be found on post mortem. Satisfactory and economical measures are known for ridding a flock of such diseases. In some cases it is advisable to abandon sheep raising for a time and allow such infection to die out naturally. A period of one year is often sufficient.

Much more attention is given to the subject of common diseases of livestock in European countries than in our own· American people are considered more extravagant in many ways than our foreign friends. Money is easier to get and is consequently more willingly spent. In some cases the owner may feel that a diseased or injured animal is a matter of small consequence and allow it to die or become worthless rather than to be bothered with treating it. In most cases it is best from a financial, as well as from a humanitarian standpoint, to provide the proper treatment for all suffering animals. This should be done in the way of careful nursing as well as in capable medical attention.

A Member: Speaking of rabies and dogs, if the dogs were muzzled would they be safe?

DR. MARSHALL: That would be the proper thing to do. In addition to that I think the people should keep the dogs in the house or where they belong. If they kept the muzzles on all the time it would be satisfactory.

A Member: Just one of these strap muzzles around the head?

DR. MARSHALL: Yes, that is a good muzzle. Some are objectionable and some are not. Some have the straps coming down the middle of the forehead. That muzzle where there are straps on each side and the muzzle goes around close to the eyes, I think we are having the best success with that kind of muzzle. It can be made cheaply with three pieces of strap and a few rivets. You must have a muzzle that fits the dog. People fix up some kind of a thing to make believe it is a muzzle which is no good.

A Member: Is glanders fatal to man?

DR. MARSHALL: Glanders is most always fatal to man. One of my schoolmates died of glanders. This schoolmate when we were just good sized boys was helping his father in the woods to bring out logs in winter. The boy's father had bought three cheap horses to haul the logs to the mill. The boy's hands were chapped from handling the snow and log chain and about six weeks after they got these horses one of the horses died. They knew the horse had a discharge from the nose but thought it a bad cold. This friend used to wipe the discharge off the horse's nose with his hand. He was taken sick and the doctor thought he had typhoid fever but soon found it was altogether different. The boy discharged from abcesses that formed on the neck and they then found it was a case of glanders. Then a treatment was begun on him. He lived nine months after the disease occurred, but all that time he was covered with boils, a regular case of farcy and glanders. The difference is that farcy is where the disease breaks out on the surface and glanders where the discharge is from the nose. In this case it was what is known as farcy. He had boils on the arms, legs and neck and all portions of the body.

A Member: Do you know of any cases of tuberculosis in calves?

DR. MARSHALL: It is very seldom that a calf develops tuberculosis until after six months old.

MR. J. ALDUS HERR: So far as which is the most detriment to the dairymen of the United States, tuberculosis or abortion in the herd, we hear quite a good deal about tuberculosis but little about abortion, and I can say from actual experience that where herds have been infected with abortion it is a very great detriment.

DR. MARSHALL: Contagious abortion is a nuisance and a great detriment to people who breed animals and causes extensive losses. That disease is one that we do not understand well. There has been very good work done in the past two years on contagious abortion. In 1905 King Edward appointed a commission of seven different men who are interested in agriculture, to study that disease. They studied it carefully and investigated a lot of cases and discovered the germ that causes the disease and they discovered a preventive inoculation. They believe yet that there is going to be something accomplished by that preventive inoculation. The commission that got out the report five years ago on how to prevent contagious abortion promised that they would make another report when they saw the results of vaccination and recently we wrote to McFadyen, of London, the Chairman of the Commission, asking what results they had in vaccination against contagious abortion but we have not heard from him yet. Their report is not out yet. It has been used for the last five years in England. There is nothing in that line done in this country. The disease in this country is pretty hard to get rid of by treatment. The commission discovered some things about this disease that I do not think are well understood. They found infection more often took place through the feed; that the animals running in the fields soiled the grass and feed with their discharge and the disease was contracted in that way a great deal more often than in any other way.

A Member: How can you prevent this abortion we have in our herds to-day.

DR. MARSHALL: I don't believe there is any way discovered that you can do it.

A Member: Anything we can do that will stave it off by inoculation?

DR. MARSHALL: No; they may have this vaccination scheme perfected in a few years so it will be useful, but at present we don't recommend it. We are going to study that disease next year. We have made arrangements to study the disease and see what can be done. If we accomplish anything we will be very glad to furnish that information to the breeders.

A Member: Is carbolic acid any good?

DR. MARSHALL: It is not worth bothering with.

A Member: In any way, as a spray or in food?

DR. MARSHALL: No; the commission to study that disease says that it is a worthless form of treatment.

A Member: The reason I asked that question is this. We have abortion all around our herd but don't have in our own herd, and we sprayed the animals with carbolic acid and fed them a little and I wondered if it helped it.

DR. MARSHALL: Carbolic acid or any disinfectant is useful to destroy infection around the stable and around the yard and where put on the coat of the animal, but I doubt if given to them hyperdermically or given internally, as done to some herds at present, I doubt if it has any value at all; but use plenty around the stable and where infection is and it is useful. It is important also if they have aborted to spray around, particularly where there may be any discharge.

A Member: We do that and disinfect very thoroughly.

DR. MARSHALL: There is another thing not so well understood about contagious abortion. That is the fact that diseased animals contract natural immunity. An animal very seldom aborts three times. The first, and not so many the second and hardly ever the third time, and if you try some remedy about the time of the first abortion you think you have cured the disease. That is the reason a good many patent medicine systems of treatment have appeared so encouraging to people who have been bothered with this disease in their animals.

A Member: Have you heard of the Roberts treatment?

DR. MARSHALL: Yes sir.

A Member: Isn't that a good thing?

DR. MARSHALL: It is useful because you follow out a good system if you follow out the instruction given in the pamphlet about disinfecting your stable and taking care of the cattle that abort. The medicine itself is worthless. It is recommended as vaccine and sold to the farmers all over the country and advertised in our stock papers and pamphlets sent out. It was analyzed in Washington by the Bureau of Animal Industry and found out there that it is carbolic acid and not vaccine at all. And you can get a barrel of carbolic acid for what it costs to treat one herd. You can use carbolic acid or creoline, bluestone or bichloride of mercury and use as thoroughly as you do that treatment recommended that you speak of and get just as good results.

A Member: Can you tell us how we can know that we have tuberculosis in our herds?

DR. MARSHALL: In looking over a herd of fifteen or twenty head you can usually tell whether tuberculosis is in the herd. If you have a herd and some animal becomes thin and emaciated in spite of careful attention and it finally dies—that may take place in four years—and maybe in six months another cow goes down. Usually these cases have tuberculosis. If you find one case of tuberculosis in the herd you may be sure you have more and the only way to find out how much is by the tuberculin test.

A Member: Has this tuberculin test ever caused tuberculosis?

DR. MARSHALL: I would say it never did.

A Member: What is the cause of garget?

DR. MARSHALL: Inflammation of the udder usually comes from bruises. Sometimes one cow hurts the other; sometimes one steps on the other; sometimes throwing a stone or hitting with a club, and getting kicked with the others. All these things may set us inflammation; and sometimes we have a bad form of the disease develop from suddenly chilling the udder. I remember a very good cow that developed a bad case of garget from lying in water one night. This cow was kept in a box stall and a bucket of water was set in the stall and during the night the cow kicked the water over and the cow laid with her udder in the wet bedding and the next morning had a miserable case of garget. She eventually got well of the disease but never was one-half as good a cow as before it occurred.

A Member: By the feeding of concentrated food, will cottonseed meal induce it?

DR. MARSHALL: Feeding rich foods, and crowding animals to get large flow of milk make them more sensitive to inflammation of the udder than where not forced.

A Member: Here is another difficulty in milking cows: Sometimes we get a case where the milk stops and cannot get out. It is swollen up at the end of the teat. What treatment would you give for that to get it out?

DR. MARSHALL: It is a hard matter to do it, but the milk should be removed if possible. Bathe with hot water and try to get the milk out. I know of cases where they use the teat tube but a man usually is too careless with such an instrument and may spoil a cow's udder with it. The tube should be kept absolutely clean before being inserted in the teat. I know persons to use a rye straw but it is not good practice.

A Member: They you would not recommend the milking machine with four tubes for drawing the milk from the udder?

DR. MARSHALL: I would not recommend that where the cows have garget or inflammation of the udder. I am not interested in the milking machines. I have seen them used but never saw one turn out successful. I don't want to recommend them or condemn them. I hope there will be a time when they will have one that will be successful.

A Member: What do you do for garget?

DR. MARSHALL: The best thing is to milk the cow frequently; cut down the amount of feed, give hay, stalks or dry feed. Milk frequently and use plenty of hot water. That kind of treatment usually brings it out but it should be done right away. Hold hot cloths up against the udder with a bandage. Hot water is the best thing you can use.

The CHAIRMAN: I had a loss this spring of two valuable foals. I would like to have a little talk on the subject of the management of young foals. These colts both lived to be a little past two weeks of age. The one of them I had in the care of a young veterinarian lately graduated and thought when I first called him that the colt would be saved. The first I noticed anything wrong with the colt was about ten days of age. When he was left out for exercise and grass he let a blue yellowing substance from his nostrils and I thought he had taken a heavy cold and the next time he was limping and I called the veterinarian then and he thought it joint ill and said it was caused from having infection of the naval and this colt died. This was on Monday and Friday night the colt died because it could not breathe. It seemed to be clogged in the head so it could not get its breath. And the second colt when the veterinarian came and while I was helping to take off the bandage we thought it would smother in the stable. Its breath came slowly, one and one-half a minute, we bandaged it again and seemed to be better and we left it till six o'clock and from that time on to midnight I worked with it, steaming it with turpentine and about midnight it was up and sneezed and seemed strong and whinnied for its mother.

DR. MARSHALL: Did you have any trouble with disease of that kind on that farm before?

The CHAIRMAN: No, not for years I have not. I have another colt in the same stable.

DR. MARSHALL: A disease of that history common in horse breeding sections is an infection that takes place in the navel and usually the first symptoms you notice is lameness. He says the first symptom was discharge from the nose.

The CHAIRMAN: One was lame; the other was not lame.

DR. MARSHALL: That was considered most always a fatal disease of colts until the last few years they have been using a vaccine that works well, with that treatment they usually get well. We had good results with it, and I think if you have any more such trouble if you will notify the State Livestock Sanitary Board we may be able to help you.

The CHAIRMAN: Do you think it is due to carelessness or bad management?

DR. MARSHALL: No. It is a good precaution to take in this case when first dropped if you touch the umbilicus with tincture of iodine or about 5 per cent. solution of carbolic acid and in some cases when troubled with this disease we put a bandage around the colt's body for 24 hours; some cotton wet with bichloride of mercury or carbolic acid and tied around the body for two or three days is good. There is nothing you can do after it is started. The treatment is practically hopeless unless you use the vaccine and then the chances are fairly good.

I think I am trespassing upon somebody else's time. I am much obliged for the attention you have given and any time the State Livestock Sanitary Board can be of use to you don't hesitate to command us.

The CHAIRMAN: The next topic on the program for this afternoon is "Cultivation and Harvesting of Tobacco," by E. K. Hibshman, Ephrata, Pa. I now have the pleasure of introducing Mr. Hibshman to you.

Mr. Hibshman presented his paper as follows:

CULTIVATION AND HARVESTING OF TOBACCO.

By E. K. HIBSHMAN, *Ephrata, Pa.*

Mr. Chairman, Ladies and Gentlemen: In this talk on tobacco, I propose to tell you the practical side of it; that is, the way the farmers grow it here and the method in which they handle it. But before I start to tell you that, for the benefit of those who do not live in this county and are not acquainted with conditions I better explain our system here. Nature has provided Lancaster county with a very deep, rich limestone soil over the greater part of it. Some parts of the county, the northern part and central part, do not have the limestone soil. Through the central part we have a type of soil that is known as Hagerstown loam; but it is on this limestone soil that the greater part or portion of the tobacco is grown, and we do grow quite a good deal here, two-thirds or three-fourths of all the tobacco grown in Pennsylvania.

When tobacco was first grown in this country, and we follow the history of the different tobacco sections, principally those of the South, we find that they grew tobacco year after year on the same soil and the result of this was that the soils gave out; they farmed out all the humus. But here in Pennsylvania our conditions were different. The first men that began growing tobacco here began growing it in rotation with their crops and that is the way we are growing it today. The rotation here in Lancaster county differs very little from that generally followed over Pennsylvania; that is. the four year rotation, wheat, grass, corn and oats, only instead of oats we grow tobacco and so our rotation here is wheat, corn and tobacco. Now, there may be some exceptions to that, where the man instead of plowing corn stubble for tobacco is plowing under sod; but in general that is our rotation. Aside from that we do something else in Lancaster county that a good many do not do, and that is we feed a great deal of stock. In Lancaster county alone there is fed annually over 40,000 head of steers. Instead of selling our corn, selling our hay and our straw the farmer goes to our stockyard—Lancaster has a very good stock market—and buys a stable full of cattle. He buys from September to November and takes them home and stables them and feeds the corn and hay and beds the straw. In the spring the fat cattle are ready for the block. Instead of getting cash, however, for his straw and hay and corn he has a large heap of manure which he puts back on the land and in that way he is keeping on the farm almost everything that he grows. Practically the only two things he sells are his wheat and tobacco. He follows that system in order to get plenty of manure, and instead of our soil getting poorer year after year here, as it did in other tobacco sections of the country, it is getting better because the humus supply is not going down.

Tobacco grown in different sections of the United States is used for different purposes and classified according to the purposes for which used; as, for instance, where they are growing a very fine leaf that is adapted for cigar wrappers, they grow what is called wrapper tobacco; another place plug tobacco and cigarette and pipe tobacco. Here in Pennsylvania we grow what is used for cigar filler, and there is an established market and demand for Pennsylvania tobacco. It is called cigar filler tobacco and whenever the name Pennsylvania is applied to tobacco you can be sure that means cigar filler tobacco.

The crop is started about the first week in April. The farmer makes a seed bed about six feet wide and as long as necessary, according to how many acres he is going to set out, and about the first week in April he sows his seed. One peculiar thing about the tobacco crop is the fact that the seed is very cheap. For fifty cents you can buy enough to grow $700 or $800 worth of tobacco. The proportion of the cost of seed to the value of the crop is quite different from that of most crops. I have here a vial of seed (showing) and you san see how very fine it is. There is enough seed there to plant 20 acres and yet that seed came from one stalk. Right along this line I want to mention where they are doing a little improvement work along the line of seed and seed cleaning. The farmers clean their seed wheat, but many of them don't stop to think about cleaning tobacco seed and in this way there is a lot of light chaff seed gotten which will give poor plants with little vitality. Now the United States government has devised a machine by which it can blow out the light chaff seed. They have a machine or glass tube about five feet long with fine wire gauze on the bottom and pour the seed in and force air through and it takes the chaff out and leaves the heavy seed in there. It makes the seed very nice and clean, and it will germinate more uniformly in the seedbed and give more uniformity of plants. He sows the seed on top of the soil, usually mixing about a tablespoonful of seed into a two gallon sprinkling can full of water and then sprinkling the water evenly upon the bed. An even tablespoonful will sow about 1 square rod. Over the top of the frame he will stretch a cloth several inches from the surface of the seed bed. This is called tobacco muslin. It is a little heavier than cheese cloth, but not as heavy as regular muslin By this time of the year they are ready to begin to plant. I happen to have several plants here about the size for transplanting. The plants are drawn from the seed bed, the bed being first well watered to let as much of the roots and ground on as you can to set in the field. In plowing we endeavor to plow as deep as you well can because the tobacco is a comparatively deep rooted crop and so one thing essential is deep plowing. The next thing to get is a fine preparation of the soil so that when you set out a plant there will be fine soil particles to put around it and not let the sun dry up the roots, and good preparation of the field is essential. There is some commercial fertilizer used in this county, but not as much as in other sections because we make so much manure it is not necessary to spend money for commercial fertilizers. It may be that like clover and potatoes it wants potash. It needs potash to give it that green color and good quality, but in using potash we must not use muriate or chloride of potash. In Pennsylvania tobacco it is essential that our tobacco burns, because, no matter what the flavor, if it would not burn it would not be any good for cigar purposes. It is essential that it burn and in buying fertilizer for tobacco we want the sulphate of potash. We find cottonseed meal for nitrogen is very well adapted for growing tobacco, because in cotton seed meal the nitrogen is available gradually. This must rot in the soil and decaying gradually give off the nitrogen. If the nitrogen is given off too rapidly in the soil it will grow too rapidly and too much of the strength of the plant goes to the frame work of the leaf and you get a heavier weight feaf but not as valuable as a plant that grows more steadily. So cotton give a good source of nitrogen because it is gradually available.

Just about this time I saw from the trolley window this morning several places where they set a few plants and our planting season is about beginning. They set these plants out with a machine called the transplanting machine, built especially for it and brought here from Wisconsin. The machine requires three men to operate it, two men to set the plants and one man to drive. On this machine is a barrel of water which waters the plant as it is set. There are cogs on the wheel from 18 to 20, 24, or 30 inches apart, depending what distance you plant, and there is a spike which these engage and runs out about half a pint of water, and every time the water is left out you set your plant and that is the way the distance is regulated. Then there is a "V" shaped plow drawn through the ground and makes a little furrow, then after this plow there are blades or paddles which draw the ground together. Between the blades and and this "V" shaped plow there is an opening in which you set your plants. The men sit on the planter with a number of plants in their laps and they set the plants with one hand, the men on the left sets with the right hand and the man on the right with the left hand and each man setting the alternate plants. He takes the plant like this and sets it in the hole where the water has been dropped and the paddles of the machine pack the ground around it and the plant sets up like that. The same machine would set cabbage plants provided your machine is built so as you could get your rows close enough.

Our tobacco is planted in rows about three and one half feet apart. We don't get much closer than three feet with the planter as it is built, but I have no doubt that a machine could be built to set cabbage plants that you could get closer. Generally the Pennsylvania broad leaf tobacco which we grow is placed from twenty-four to thirty inches in the row with the rows about three and one half feet apart.

The first trouble after planting is the cut worm. Very often a few days or even the first night after the tobacco plants are set out this worm will eat off a great many. Various remedies have been tried and the one most successful and practical on the experiment plot was in making a mixture of about a bushel of bran, a pound of Paris green and a quart of molasses and put enough water to it to get a crumbly mass and mix all into a candy bucket and take a small bucket and drop a pinch at each plant. The molasses will draw the cut worm and he will eat that before the plant. Last year in planting an acre, planting by hand on account of the large number of small plots, we turned up many cut worms with the trowel, and in planting that acre. There must have been a great many that we did not turn up. I put on that mixture of bran, Paris green and molasses and not more than six plants on the acre were missing. We think that an effective method.

After your field is set out the cultivation is almost the same as that for corn. The first cultivation we do not work too close to the plant. The roots of the plant must be established before we start thorough cultivation; then cultivate deeply for a while and gradually right up towards the plant. As these leaves develop it will lay down and spread out and by ridging up we can keep it thrown up and make it easier to get through the rows.

I have here a number of stalks of tobacco. While the crop is growing other insects attack it. There is one worm known as the tobacco worm that causes a lot of damage. A moth comes flying over the fields in the evening, and lays its eggs on the under side of the leaves. These eggs hatch out into a small green worm. The worm grown rapidly and in three weeks it gets about three inches long. It shears off the leaves and eats everything but the mid rib. Then it creeps into the ground and changes into another pupae and later comes out as a moth and lays another set of eggs. There are two broods in a year. Another insect is the grasshopper. This jumps and will eat a hole in a leaf and then jump over to another leaf and eat a hole there. Sometimes there is a little black insect called the flea beetle comes along and eats a small hole, a shot hole. These are not so injurious to cigar filler tobacco but yet damage it quite a bit. One of the worst things is a hail storm. A hail storm will ruin the entire crop. If a hail stone goes through a leaf you can always tell the mark on the leaf.

Now I have here a cured stalk of tobacco just as taken out of the curing shed during the winter. Now the purpose of the tobacco plant, of course, will be to produce seed. Along towards fall, about the last of July, there appears on the top of the plant here a bud which will be a seed head. If you leave that bud develop and the flowers come out and seed develop, it is going to change the type of the plant. The upper leaves will be small, hard and woody, and the plant will not ripen up and the quality of the tobacco be poor. So we go along and break out that seed head as high as you want your plant to be and with as many leaves on as you want to it. That is called topping. Sometimes some of the sections will top ten leaves, some twelve leaves some more. As soon as the plant is topped it developes what is called suckers. In the axil of each leaf there developes a branch same as that developed, first above. This appears first at the top leaves and then on down the stalk. If you leave these grow they will grow up and develop seed and the branch growing up in the axil of the leaf would naturally take the strength away from the leaf, so the grower keeps that broken out. After the upper four are broken out about four more come in and that way on to the bottom of the stalk. By keeping these broken out you drive all the strength of the plant into the leaves and get a larger, finer, softer leaf. If you leave the suckers grow it will be the same as not topping the plant, because the strength of the plant will go into the suckers and the leaf will suffer and get hard and woody. Ofttimes the weather has a great deal to do with the time the plants seed. If we have a spell of dry weather then the plants go to seed a good deal sooner. It is natural they should, too. You qut a good plant under adverse conditions and it will try to develop seed and reproduce itself before the strength is gone.

The better the grower cultivates the soil the better he conserves the moisture and the better the growing conditions are for the plants. During the seasons of 1908 and 1909 I saw a great deal of difference on different farms here in the county. One farmer when the dry weather set in stops cultivating. Another grower kept on cultivating. The man that stopped was losing moisture because the ground became hard and baked. And the man who kept on cultivating kept a mulch on top and prevented the sun from evaporating the moisture. The season has a great deal to do with the size and body of the leaf. During a very dry season your leaf will be shorter and a great deal heavier. During a wet season it grows more rapidly and grows finer. The quicker the plant grows the better the leaf. In Connecticut and Florida they use a great deal of commercial fertilizer and grow more rapidly in order to get a thin leaf. If a get dry weather it makes a heavy leaf. We don't want too thin a leaf, though it not advisable to get too heavy. We want a medium weight leaf and good size.

During all this time or almost any stage of tobacco there is a disease that is liable to set in and, by the way, there is no section of the country in this world that does not have this disease. It is a disease called Calico, or technically known as mosaic. If it attacks the plants when young the plants become rusty and go to pieces. When it attacks the plant almost grown the upper leaves get it, but the lower leaves do not develop it and the upper leaves show very little sign of it after cured. It does not do much damage after the plant is grown up, but when it attacks the young plants it will do damage. Just what the cause of this disease is we do not know, but it compares very favorably with the "yellows" in peaches.

About the last of August or first of September the tobacco begins to ripen. Then it is ready to put away. When it stops in its growth it is said to be ripe and there are several simple tests which will tell when this stage is. The leaf as it stands on the plant stands this way. When the leaf begins to ripen, around the edges here you will notice sort of a mottled appearance. You will see a green little spot with more green. It gets a mottled appearance and if you take hold of it, it feels like leather, and then your tobacco is ripe and ready to cut. At the same time when the leaf is ripe and you turn it over between the finger and thumb it will crack, and you can be sure that your crop is ripe. It has come to the stage where it is going to cure up with better coloring and weight.

Before we come to the harvesting I better mention a little about the selection of the seed plants. There is one mistake that the farmers have made in this section as well as in other sections, and that is the careless, haphazzard way in which they select the seed plants. Usually they let a half dozen stalks stand for seed. They don't appreciate they should have the best stalks in the field for next year's crop. The proper thing to do would be when topping to pick out the seed stalks and look for certain qualities—I am not going into breeding work—but one of them is the number of leaves on the plant. Many of our farmers have strains that will produce twelve or even fourteen leaves. By counting the leaves they will be surprised to find the difference. Here is a plant that has fourteen leaves and here is one that has sixteen leaves. If this plant here has enough vitality to develop sixteen leaves next year where this has fourteen, it will mean two leaves more on each plant. That will mean quite a few pounds more in the aggregate. This type here has eighteen leaves. This is, however, a good strain or type, but it was not taken right out of the field, commercially grown. It is out of an experimental crop. But the point I want to make is that the farmer should pay more more attention to the selection of the seed than he does. He thinks that is an easy matter and pays no attention to it.

After the crop has become ripe they begin to harvest. The stalk it cut off at the ground with a pair of long handled shears. After it is cut off it is allowed to lie on the ground for an hour or more to become wilted. It is then picked up and speared upon lath. Tobacco lath are four feet in length and a little heavier than the sort used for building. On the end of the lath we put an iron spear. The iron point is forced through here. About five or six of these stalks are strung upon the lath and then it is taken to the curing barn. The curing process takes eight to ten weeks in our climate on this kind of tobacco. There is a thinner tobacco that cures more rapidly. When this plant is cut it is very heavy. A lath with six stalks like that on is as much as one man can handle, and work all day handling. Now then practically all that moisture must go out of the stalk by evaporation in the curing barn. The curing barn must be well supplied with ventilators in order to keep the air moving and carry out tons of water held in there in that green crop. Curing is not simply the drying out of all moisture. It is the general impression that curing is simply a drying process. It is not. When this plant is cut off at the ground the supply of nourishment is cut off and that plant starves to death. Now if that tobacco lays in the sun too long and becomes scorched or sunburnt it will not cure up, but always stay green in color. Rapid chemical changes take place in the leaf in curing. The last of the crop is harvested just before frost. Sometimes we get caught with the frost. Frost will ruin a crop of tobacco. It is another thing that the growers must watch out for. There is perhaps a worse thing that the grower must watch out for. When the moisture is evaporating out of these leaves in the shed and warm, dark, cloudy weather comes, he is likely to have his tobacco pole-burn, and after pole-burn once gets started it is hard to check, and in the course of four or five hours it will ruin a crop of tobacco. Pole-burn is a fungus disease that attacks the surface of the leaves and decomposition sets up, and it will become black as if it were rotting and the next day the leaves fall to the ground. This makes the crop practically worthless because you cannot touch the leaf without your fingers going through it. And it is damp, foggy weather that brings about this disease. So that when the grower sees that he is going to experience that kind of weather he closes the ventilators in the shed. So he must have the shed shut up. Then at other times he must open up the shed and let the fresh air in and the shed must be fixed to open up and close up. If hung too close the air cannot circulate through it.

A Member: How close on the racks do you hang it?

MR. HIBSHMAN: It depends on the size of the tobacco. Some years it grows very stiff that the leaves stand out, but generally you leave a margin of seven and one-half to eight inches. I know men who hang closer. After it is hung for several days, then many hang it closer. It is just when the leaf is changing color—it is green when it comes into the shed and the first change is to yellow and from yellow to brown—and it is just while the leaf is changing to yellow that the moisture is going off most rapidly and the greater the danger from pole-burn. There are several other diseases that come in through the winter, but they are not nearly so dangerous. After the tobacco is cured the leaves are so brittle you cannot touch it, so the grower must wait until damp weather comes on. As soon as that comes and it gets moisture and becomes soft so he can handle it without breaking it he takes it down from his shed and puts it into a damping cellar. Under one of the sheds he has a large cellar divided into two parts, the stripping room and the damping cellar. The damping cellar has an earth floor and a very little light. It is hung in there and gets damp, and when it gets so damp that he can take it up without breaking, it is then taken to the stripping room and then the stalks are stripped from the leaves. This is what is called stripping tobacco. The term "stripping tobacco" as used means different things. With the grower it means taking the leaves from the stalk and sorting and tying up in hanks. With the manufacturer it means taking the mid rib out of the leaf. The term "stripping" does apply to both operations. He takes them in the cellar and strips the leaves, and that stem is valuable as a fertilizer. It contains a great deal of potash and I have no doubt about the nitrogen. The farmers apply them to the corn ground.

A Member: Does he apply them in that condition?

MR. HIBSHMAN: Usually in this condition and they are put on in the manure spreader.

Now then he has his leaves stripped from his stalk, but these leaves are not all alike. There are some poor ones in there. The lower leaves of the plant as it grew in the field came in contact with the soil and they got dirt on them. These are called ground or sand leaves. They are not as valuable as the other leaves and consequently he makes two grades and in one he puts the ground or sand leaves and all torn, broken or worm eaten leaves, and in the other grade he puts the best leaves. So he takes the tobacco from the stripping table and sorts out all the bad leaves. Usually there is about a proportion of one to six or one to eight of second grade or ground leaves leaves to the best leaves in the crop. Then his next concern is to sort these different grades out according to the length of leaves. That would not show any good sorting (illustrating). But where he has a large bulk usually one man strips off and another sorts and several lay out. He will lay the longest back here, the medium in the middle and the shortest one in front, graded up that way, and then reaching at one side he gets a handful, as much as I have here, and he ties them up with another leaf, usually taking a leaf out of the second grade, taking about a dozen leaves and making the ends nice and even. There is a difference. Some growers do it up more carefully than others because in tying up not many growers will make the butts as even as that. You have three to four inches difference in the butt end of the leaves. It shows poor sorting. I think it would pay the growers to tie it up neater. He takes it up and ties it with another leaf. That is known as a hank. Some places a hank is called a hand of tobacco. His whole crop is put up that way. Of course, the leaves are uniform in length, maybe a half inch or so variation. In this condition the grower sells it and after it is done up this way he usually bales it up in bales of 50 pounds and covers the bales with paper. This is the paper used in baling them. They have baling boxes made especially for certain sizes, about 34 inches by 18 inches each way. The paper is wrapped around these bales and they are tied with three wraps. Then it is in that condition that the grower sells it to what is called the packer. Remember this tobacco is what we call green. It would not be fit to smoke. It has the gum on. It has not the color or texture, not at all like the tobacco you find in the cigar shop. It must have good fermentation and sweat in which it will lose twenty per cent. weight going through the sweating and it takes the gum off. This tobacco is sticky. It has the gummy excretion of the leaf which in fermenting is broken up and dispersed. There are not many growers that sweat the tobacco. They sell to the middleman, who does the fermenting and sweating and sells to the manufacturer. And it is done up in hanks like this and tied up in the bales that the grower sells to the packer. Now in Pennsylvania the packer goes from farm to farm and buys the crop. Each farmer is his own salesman. There are some sections where they sell on what is called the block. A farmer may have a large crop and may want to sell at once, and he makes known that Mr. Black will have a public auction. The buyers come there and bid against each other. I believe there they get a more fair price for tobacco than in Pennsylvania, because the packer goes to farmer after farmer and says: "Sell me your tobacco at ten and three. That is all we are bidding and we want your whole crop." "Well, I think I will have to sell for that," the farmer says. And that is the way a great deal of tobacco is sold. It is not bought on its merits as much as it should be in Pennsylvania. That is only the objections in selling. I believe if the grower would do the crop up better he could get better prices for it than he does.

A Member: Could the growers eliminate that middleman by packing their own tobacco?

MR. HIBSHMAN: He could; but a great deal of our tobacco is farmed—I forgot that. When it comes to the first of April—a great deal of the tobacco is farmed by tenants. For instance, you own a farm and the farm will have shedding for ten acres and you only grow five acres. You have not the help. Then you give that out to a cropper, and you supply the manure and furnish the teams and the man does all the labor. The man who owns the land gets half the crop after dividing the cost of the fertilizer between them, so the tenant farmer and the owner share alike in the crop and can sell independent of each other. Besides that we have in Lancaster county a very conservative class of farmers that would be slow to enter into any corporation of that kind. That would be the best way though, and no doubt it would work if the man had capital to grow a large crop and pack it himself.

A Member: Isn't it a fact that many growers as soon as they get in a position to farm and pack their tobacco they become packers themselves and buy off the farmers?

MR. HIBSHMAN: That may be. The difficulty would be to get the people to organize to work it out.

Now you want to know what it has cost to grow this tobacco. In 1908 we kept a record of twelve different farms in the county, and counted the rental of the farms and buildings, the depreciation of equipment, all the expense of preparing and manuring the land, cost of all labor in planting, cultivating, harvesting, curing, stripping and preparing the crop for market, and every item of cost that enters into the production and sale and the average cost on twelve different farms was 7 4-10 cents a pound, and we had an average yield of 1,638 pounds to the acre. On some of the farms they were growing over a ton to the acre, and I remember one farm that averaged over a ton to the acre and the cost of production was 6 4-10 cents a pound, just a cent a pound less than the average for twelve farms and that farmer got out in having over a ton to the acre and he had more pounds and the cost of production was therefore cut down. When I was talking about the selection of seed stock by taking care to get plants of a strain that have a large number of leaves, I was looking to the yield, because the more leaves you get the greater the weight to the acre and that much less the cost of production will be.

A Member: Which is easier cured, the stalk with a lot of leaves or the stalk with not so many leaves?

MR. HIBSHMAN: If you have a stalk with a large number of leaves with short stems, set close together, you will have the greatest trouble in curing because the air cannot draw up between and there is another thing, that is the shape of the leaf. A leaf wide at the heel, at this part, you see when this tobacco hangs in the shed the air cannot get up through there; and there is another thing enters in about that width of leaf. I don't life a leaf very wide at the heel.

By holding up to the light you can see that this part of the leaf is thin and flimsy. That part of the leaf grew in the shade. It does not have the quality and body. It would not make as good smoking and would be more bitter. So in picking a seed stalk we like a stalk that sets the leaves up more. Then the sun shines down through the leaves and shines on the leaves below. We get more leaf surface. I am convinced that in picking a strain that gives a large number of leaves will give a higher yield. I can take you to a farm where this strain of tobacco growing yielded 2,400 pounds to the acre and a type of tobacco that produces a great many leaves where other types do not produce so many.

A Member: What type is that?

MR. HIBSHMAN: Weaver broadleaf.

A Member: The packer condemned it to me on account of the wide heel.

MR. HIBSHMAN: That is one thing I don't like. I do not like too wide a heel because from the packer's standpoint it is not so valuable.

MR. LIGHTY: Will you tell us what the selling price of that tobacco was? How much money you people are making?

MR. HIBSHMAN: I don't know what the average selling price was, but along about ten to eleven cents; along there.

MR. LIGHTY: What is an average yield of a good crop?

MR. HIBSHMAN: 2,000 lbs. to the acre would be a good crop. It cost a little oved $100 an acre to grow that crop. But crops grown larger than this last year. I know one crop, just an acre, that sold for $250. It would cost just as much grown commercially.

MR. LIGHTY: Making 100 per cent. on the investment?

MR. HIBSHMAN: Just about.

A Member: Permit me to ask again for that mixture of Paris green, bran and molasses.

MR. HIBSHMAN: One bushel of bran, one pound of Paris green and one quart of molasses; all mixed in a candy bucket and put enough water in to get us crumbly, so if you throw a handful down it will break up.

A Member: And the principle is that the cut worm will come on the surface and eat it?

MR. HIBSHMAN: Yes, sir.

A Member: How long will it take to place it on an acre?

MR. HIBSHMAN: It don't take very long. The other evening I got a fellow at it and he was over in a hurry. A man can just walk along.

A Member: Will it yield more money on an acre of tobacco or potatoes?

MR. HIBSHMAN: Well, there is a different proposition comes in there. You can make more on tobacco here than on potatoes.

MR. A. P. YOUNG: There is a question I would like to ask. He spoke of cotton seed meal as being a very good fertilizer. I want to know whether that cotton seed meal is used directly or whether it is fed to the stock in the stable and then used?

MR. HIBSHMAN: It is done both ways, but where we use commercial fertilizers we use it direct. On the experimental plot, for instance, last year I used it direct, and South Carolina rock, 14 per cent., and sulphate of potash.

A Lady: Do you know anything about putting carbolic acid in the water and on the ground for cut worms?

MR. HIBSHMAN: I have heard of that, but never tried it. I don't approve of it.

A Lady: We tried it and seemed to have good results.

MR. HIBSHMAN: I heard of some cases where it worked all right. I heard of a great many cases where it did not help at all. If you get rain within a day or so it carries it off the field. When dry it carries a great deal of acid and would kill the worm and would keep them away from the plants until the smell got away. Where the bran, Paris green and molasses attracts them and the cut worms eat it.

The CHAIRMAN: We will now take up the last number on the program for this afternoon, "Market Gardening," by Mr. M. H. McCallum, of Wernersville, Pa.

I now have the pleasure of introducing Mr. McCallum to you.

Mr. McCallum then presented his paper as follows:

MARKET GARDENING.

By M. H. McCALLUM, *Wernersville, Pa.*

Mr. Chairman, Ladies and Gentlemen, and Fellow Institute Workers: It gives me an exceptional pleasure this afternoon to speak upon the subject that has been assigned me, namely, market gardening. While I cannot upon this subject give vent to my greatest enthusiasm along agricultural lines, yet I have always had a great interest in the growing of vegetables, and a good reason, no doubt, is the fact that I was born in the vegetable garden, brought up there, and have ever lived there, and the end seems not yet. The subject is an immense field and I shall consider briefly only some of the outcroppings with an eye single to the interest of the market gardener.

If the man who believes that in agriculture the best opening lies along the line of market gardening he should recognize early the importance of adding to what he already knows, whatever scientific knowledge and training he may be able to secure. It is hardly necessary to say that the chief object of every gardener is to make money. But in gardening as in every other business the most successful are those usually who have best knowledge of their undertaking. The more advanced and complete are his ideas the more successful will be his work. The more he knows the more he can do. We need forethought in all lines of agriculture, but when we are wanting in this respect in the market garden we fail most wretchedly, for the market gardener must show more knowledge, care and attention than does the general farmer who raises only the staple crops. The most successful market gardeners are men of high and definite purposes and are never satisfied with ordinary results. They are men who read and they are men who think. Market gardening can be made a very delightful, profitable, and all desirable vocation, but on the other hand it can be made and is made by many these days a slavish life of drudgery—men and women eking out a wretched existence, simply, either because they are not putting brains into what they are doing, or by force of habit have no desire for recreation or self-preservation. It has been said by a successful tiller of the soil that a man should be so resourceful as to be able to spend one day of the week sitting on the fence and watching his crops grow, and by another who adds that that day should not only be Sunday either, but a week day as well, and perhaps they are right. Anyway, I believe a great need of the average gradener today is more and better knowledge of the principles underlying successful gardening, the use of scientific facts and the result of the experience and investigation of other gardeners and experiment stations.

One of the simple things in the practice of the gardener that is invaluable is the keeping of a diary, and from this diary kept from year to year formulate a calendar or record of time of planting and seeding the various crops. The farmer has but a few crops to plant and so has the dates well fixed, but with the trucker it is quite different, there are very many plantings to be made and each as important in point of time and season as any farm crop dare be. And there are the various successions that have to be noted. All this is confusing unless there is something to guide. There is a season when a gardener can think and plan at leisure. He should then make definite record of plans and purposes. This with the time of seeding and the various successions should be conveniently displayed; giving valuable assistance at a time when time itself is at a premium.

Every gardener before he can hope to make a success must be thoroughly alive to the best methods of production. The soil in the first place is no small factor. The gardener should know his soil; its likes and dislikes. He is very likely, in the early spring, through enthusiasm and over-anxiousness to have an early start, to be unwilling to await proper soil conditions. The working of soil at such time is harmful and cannot be remedied the entire season. He should direct every effort to securing the best kind of a seed bed. The great importance of good tilth has always been appreciated by practical men, and experience has abundantly taught us that care should be exercised in bringing the seed into perfect tilth before receiving seeds or plants. Seed placed into mellow soil will allow the roots to grow unhindered in any and every direction in search of moisture and plant food, and it is this intimate and close contact of the absorbing surfaces of the fibrous roots with soil particle that nourishes and sustains the plant. Again, the fact remains, that unless there exist proper soil condition he may lavish upon the gar den spot all the plant food he pleases and there will not be the results desired. Soil for the garden should not bake and crack, or run together and puddle after rains. But how are we to secure the proper physical condition? The crying need of our Pennsylvania farms and gardens to-day is more humus. We are preaching it and yet it is being used twice as fast as supplied. Gardeners living near the cities can often supply this cheaply in the form of stable manure, while it remains for the other fellow to resort to green manuring. However, he has not need of being discouraged. Green manuring is a well know fact, but its importance is by no means appreciated. Every inch of the garden should be wintered with some cover crop to furnish organic matter, and to save from leaching the available plant food, and also in case of a legume to furnish nitrogen. Crimson clover and cow-peas may be grown to advantage in some parts of the State. Rye and hairy vetch are more appropriate because they can be sown later. Then rye may be sown as the last resort; say 3 to 4 bushels per acre.

However, in this connection it might be well to say a word about lime. In turning down these green crops he should not overlook the use of this important element to correct acidity. It seems we use too little lime in our market gardens anyway. Manuring heavily from year to year necessitates liming as well to keep the soil in good sanitary condition. In visiting market gardeners through Philadelphia county last summer I was very much impressed with what benefit a little lime would be upon some of those garden spots. While being shown over one of these large plantations I was told of a certain field that was not doing its duty, and as we approached and noticed conditions I could not help but feel that a little lime would do it good and so suggested, and the point was well taken.

In further consideration of the soil as a factor in successful production we must not overlook the act of cultivation. This is an all important operation and must be done at the proper time if the crop is to be kept free from weeds and in a good growing condition at the least cost. It is important to keep the soil well stirred both to conserve moisture and dew-elppe plant food. There are times through the growing season that if this is neglected only for a few days it will result in considerable loss.

Every crop from seeding and planting time until harvesting must be watched with an eagle eye. The method employed in producing certain crops successfully last season may have to be modified in growing the same crops this season. Insects, pests and fungus diseases require no little vigilance, and we must know how to meet them and be ready to meet them. Rotation should be carefully observed. Aside from many other benefits it means renovation. This fact was forcibly brought home to me several years ago in taking hold of a large garden where rotation was regarded of little consequence. And of all the diseases, insect pests, maggots and what not, made me almost feel like giving up in despair. But the following year we sought refuge in another location, practiced rotation and eliminated many former troubles.

It goes without saying that to produce bountiful crops and crops of quality and appearance we have to fertilize heavily, and stable manure is the truckers great stand-by. And yet as cheaply as this may be placed upon our gardens, I believe that an intelligent use of commercial fertilizer is profitable. And the gardener should be his own mixer. He should experiment with the plant food elements singly and in combination upon the crops that are his money makers. It may be a little easily available nitrogen will do wonders, especially in the early spring when nitrification is not active. Taking the average of 18 or 20 of the main garden vegetables, and we find that manure as it comes from the stable is practically a balanced ration for them. And yet experience teaches us that an application of phosphoric acid in connection with the manure is greatly beneficial. We may find too that potash will be helpful upon some soils and upon certain crops. And so for the man who uses commercial fertilizer, there is no reason why he should go it blindly. Let him ask intelligently of the soil and it will respond through the various crops with all the apititude of nature.

Another factor that is altogether vital in the market garden is the seed proposition. Its importance cannot be too strongly emphasized. Men of experience can trace many a crop failure to the purchasing of bad seed. There are many discouragements to encounter in the market garden, but not a few are offset by taking the proper precaution at this point. The mere fact that seeds germinate does not tell the whole story. I know a gardener who set two acres in cabbage and at harvest time there were good cabbages, brussel sprouts, cauliflower, and everything between. Whatever seeds have to be bought should be bought early. Have nothing but high grade and be willing to pay well for them. Most growers have a few kinds in which they are especially interested, and are selected with more than ordinary care. It is desirable to obtain from such a source all seeds of crops in which we specialize. However, it seems to me the gardener should practice the selection of seeds more than he does from his own plantation. Some few seeds such as cauliflower are best purchased from a reliable source. He cannot produce such seed profitably. But with such crops as sweet corn, cabbage, onions and tomatoes, etc., there is a vast opportunity for improvement. It is right here where the gardener with a little skill and care can raise a peg or two by selecting choice seeds and improving the strain from year to year. He should have his ideal and select upon merit. Close attention along this line will be amply rewarded, and give satisfaction.

Again to be successful the market gardener must be thoroughly alive to the best methods of selling and distribution. For it is at the market end that skill counts for most in securing maximum profits. And he who is wise in producing and likewise apt in disposing of his product we will term a successful gardener, for these are two qualities not always found in the same person. To produce is one thing, and to sell another. Many succeed admirably in the production of vegetables, but fail at the profit end because of inability to market. They fail to see the force of appearance and condition, and attractive recepticles. Their grading may be defective. First class goods may not be strictly first class. Size, shape, color and soundness are not properly regarded. Attractive appearance catches the eye and goes a great way in clinching a bargain. Then there is the other fellow who can usually sell to advantage whenever he has anything, but they are often such that like to sit on the fence and not alone watch the crops grow. The vegetable garden is not the place for a world of ease, by any means. It is no business for the careless, the lazy or the stupid. Its occupant must be ambitious and not afraid of hard work. He should never know where to place that which he grows, and grow that which he is possible to place. We must cater to the wants of the public, and yet be original enough to create a market where this is possible. Start in moderately to fill a want existing. Try to have your vegetables upon the market a few days before your competitor, keep your goods from the consumer's eyes. Study the market, the demands of certain articles. Educating the peoples' tastes for certain goods is a slow process. Quality may sometimes have to be sacrificed for outside attractiveness. Aim at uniformity of bunch or package, and cleanliness. Endeavor to establish a reputation by inspiring confidence and reliance in all you say and do. Retailers like to deal with growers whose word is as good as gold. Abide by that trite saying "You see top you see all." My experience has seldom gone so far as the middleman, and yet as dealing directly with the consumer the best policy always is honesty. In gardening as in every vocation in life there are many uncertainties, but one of the sure things is that your sins will find you out.

Deputy Secretary Martin then announced the program for the evening.

The CHAIRMAN: We will now stand adjourned until 7.30 o'clock this evening.

Thursday Evening, May 25, 1911, 7.30 o'clock.

Mrs. Sarah B. F. Ziegler in the Chair.

The CHAIRMAN: The meeting will please come to order.

DEPUTY SECRETARY MARTIN: It was our intention to hold a session to-morrow morning when the Resolution Committee would be ready to report and their report be acted upon. It seems that a goodly number of the members desire to leave this evening for their homes after spending the entire week, leaving their homes early on the Sabbath on important business, and before taking up the regular exercises of the evening we will hear the report from the Resolutions Committee. Mr. Joel A. Herr, Chairman, will please make that report now.

The report of the Resolutions Committee was then presented by Mr. Herr as follows:

REPORT OF THE COMMITTEE ON RESOLUTIONS.

Memorial.

Since our last meeting at Butler, Pa., our ranks have been reduced by the demise of the following Institute Managers and Lecturers, viz:

Hon. Jason Sexton, of Montgomery County.
Hon. Charles Miller, of Snyder County.
Hon. E. S. Hoover, of Lancaster County.
D. W. Lee, of Bedford County.

Hon. Jason Sexton was stricken down by disease while making a Memorial Address in his own county on last Decoration Day. He was a veteran of the Civil War, having served for four years in the Union Army. He was a prominent and strong lecturer on the Institute force, a Member of the State Board of Agriculture and Manager of Farmers' Institutes in his county for many years. He served his county faithfully in the General Assembly for three terms. His life was a type of the highest Christian citizenship and his name will long be remembered and revered.

Hon. Ephraim S. Hoover died June 11, 1910, aged 74 years. In early life he taught school but poor health induced him to take up farm work and for many years he carried on farming successfully. His county honored him by electing him a Member of the Legislature. He was also a Trustee of the Millersville State Normal School, Institute Lecturer on farm topics, Assistant County Manager of Farmers' Institutes and also held a number of other positions of trust and honor. He had a wide accequaintance and was a much honored member of his community.

Mr. D. W. Lee died at his home May 3, 1911, of tuberculosis. He was a man of more than ordinary intelligence, a man of temperate and industrious habits. Mr. Lee was a veteran of the Civil War, serving his country honorably. He was a Member of the State Board of Agriculture and County Chairman of Institutes at the time of his death.

Hon. Charles Miller, who died since our last meeting, was for many years Manager of the Farmers' Institutes in his county. He served his county with credit in the Legislature and was a citizen of the highest character and was held in general esteem by his fellow citizens.

We desire to express our sorrow at the death of these our fellow workers and extend our sympathies to the bereaved families. We ask that these testimonials be spread upon the report of the proceedings of this Institute.

We desire to express our appreciation of the warm reception accorded us by the people of the City of Lancaster, and therefore resolve:—

1st: That our thanks are extended to Mayor McClain for his earnest words of welcome.

2nd: To our co-worker, Mr. J. Aldus Herr, and his associates for the complete arangements made for our comfort and pleasure while here.

3rd: To the County Commissioners for the use of the Court House for our meetings.

4th: To the able Lecturers, who have instructed us, for their able addresses.

5th: To Director Martin for his successful efforts in making this one of the best sessions this body has ever held.

J. A. HERR,
J. H. SCHULTZ,
J. ALDUS HERR,
W. F. BIDDLE,
L. W. LIGHTY,
Committee.

DEPUTY SECRETARY MARTIN: You have heard the Report of the Committee on Resolutions. Are there any remarks?

MR. CLARK: I move that the report be adopted as read.

The motion was seconded, put and agreed to.

MR. DORSETT: Before we take up the regular program for this evening I would like to bring one more subject before this body and do it briefly. One of the most important subjects perhaps before the farmers to-day is that of co-operation. I have been unable to attend all these sessions but I have been attending an important meeting on co-operation in New York City; one also on parcels post; and on my may in took in the Milk Show. This is what I would have done: I would like this body of institute workers and county chairmen to consider this subject of co-operation, and for that purpose I move that a committee of three be appointed on co-operation and that they are to investigate the ways and means to secure co-operation between the farmer and the consumer and report at our next meeting.

MR. BLYHOLDER: I second that motion.

The motion was put and agreed to.

DEPUTY SECRETARY MARTIN: I shall appoint on that committee, Mr. Dorsett, of Tioga; Mr. Kester, of Clearfield and Mr. Billings, of Erie counties.

The CHAIRMAN: We will have a Ladies' Session now and owing to the lateness of the hour I will ask the speakers to confine themselves to forty minutes talk. The first speaker of the evening will be Miss Sara Phillips Thomas, of Philadelphia, who will talk to you about "Gleanings from Other Countries." I think you will find this talk very interesting. I now introduce to you Miss Sara Phillips Thomas.

GLEANINGS FROM OTHER COUNTRIES.

By MISS SARA PHILLIPS THOMAS, *Philadelphia, Pa.*

Mr. Chairman, Ladies and Gentlemen. To-night I wish I had been asked to speak on "What is the Matter with the Men of Pennsylvania," because this thought has been going through my mind very much for the last few days and weeks, and when I realize that we have 600,000 men members of the great churches in this State is it any wonder that we are really trying to do something for the childhood of our State to stimulate a better manhood and womanhood. I ask why you men of Pennsylvania put such a low valuation on the expression of your citizenship; why you do not send men to Harrisburg, when you have it in your power to control the balance of power in the Senate and House of Representatives, men that are men, that are stalwart men, that will not only make us good laws but stand for the upbuilding of the State and the protection of the home; and I appeal to you to use your votes in this way, to use your influence over the other Christian men of this State.

And now to-night we are to realize that there are many ways in which we get our education even after we leave the scholastic halls of learning, and I think you will agree with me that as long the earth exists that we must go on in seeking knowledge and enlarging our sphere, and one of the pleasantest ways by which we can do this is by means of travel and if we are fortunate enough to get into the old countries beyond the seas we find a splendid opportunity to study life, art and history, as well as to enjoy the natural scenery everywhere around us; and I am going to ask you, in the limited time I have to-night, to take a rambling trip with me and I will start with you in that magnificent harbor of Queenstown, and I ask you to picture that old town on the height above the harbor with a perpendicular wall of about 80 feet rising from the water's edge and high above that you find terrace after terrace planted with beautiful shrubbery and flowers. We landed in this town about 2.30 o'clock in the morning and at 4.00 o'clock the day had dawned and so it occurred to me that we might profitably use our time by taking a jaunting car ride and for some of you who are not familiar with a jaunting car I will describe it. It is a vehicle that carries properly four people and the driver, but the great advantage is that you can pile in any number and use but one horse to it. It has seats that run lengthwise over the wheels and the reply that the driver made to me when I asked him about the ride, he said: "Oh, yes, miss; it is a fine thing to do. It will shake your breakfast down and shake your liver up." And so it will if the jaunting car is not properly balanced because it is one of the roughest vehicles if you do not have your load properly balanced. We rode around the streets of Queenstown and felt transported into fairy land as we looked upon the liburnum, which as many of you know belongs to the locust family, with long festoons of yellow plume and as we looked up into it was one mass of golden beauty; and then aside from the liburnum the rhododendrons in the very prime of their beauty and the pink and white hawthorn hedging the fields, and then, too, the native goose or wind which is found in England and Scotland and covered all the hillsides and meadow lands, and as we left Queenstown and hurried on to breakfast in Cork we enjoyed the magnificent beauty of this mass of yellow bloom as we looked from our car windows. In Ireland in striking contrast to all this natural beauty—but in contrast to all this you find the most abject poverty that I have ever seen and you find dunning behind your vehicle the little urchins begging as long as their breath holds out and you hear them saying: "Copper, sir; copper, sir;" until they can barely lisp it.

I am not going to ask you to stay in Ireland more than just to take a peep into the country fair and realize the way they handle their stock in the markets. Once a month the country folk come in with their cows and pigs and their children, which of course they do not sell, but the livestock are brought for sale and they congregate in the commons and opens and have a good social day of it as well as a profitable market auction.

Then I am going to ask you to leave Ireland and travel across Scotland and up on the highlands and view the historic parts of Scotland. Let us just pause at the Island of Ionia that Robert Louis Stevenson has made so famous and as we visit the battle fields remember the stirring incidents of their time and all through we find an association of history that gives a keener appreciation of the natural beauty of the places. It may be interesting to tell you that while I was in Scotland I met there in Edinboro during the World's Missionary Congress our great American orator, William Jennings Bryan, who was the great orator of that occasion. I was also fortunate enough to be a fellow passenger on the steamer with him in crossing the ocean. The morning after Mr. Bryan spoke in Edinburgh the thing that interested me very much was the way the British papers spoke in regard to it. Something like this appeared in the morning papers. As you probably know, there was a limit of seven minutes to each speaker. Even to those men who had spent ten years in gathering information to present to that great congress was allotted only seven minutes to give the results of their investigation. And the papers said that in the seven minutes at the beginning the Britisher would begin by apologizing for the very little that they can say in seven minutes while at the end he would be found apologizing for the small amount he would say in seven minutes. While the American would begin by saying, "I want to tell you such and such a thing," and by the time he had reached the middle he had covered half of his subject and when he had finished there was nothing left to say upon the subject. So I think it is remarkable that the Britishers who have a good opinion of their own people and their own oratory should pay the Americans such a compliment as that in their local papers.

The country I want you to travel longest in to-night is Norway. We find a country not as much travelled as some others and so very different from our own in appearance, in agricultural points and contrasting effects that it brings particular interest to the American tourist. In the southern section of Norway we find mountains and waterways and as we travel on the little boats and look up at the mountains we have a feeling that there is nothing beyond the horizon line, that the world stops with the mountain top and if we were to reach that particular mountain top I am sure we would have the same feeling that there was nothing beyond the horizon line of the next mountain, so closely are they hemmed in together. So you can realize that there is little tillable ground in the southern section of Norway. The farms or Sagties as they call them are principally on top of the mountains. In the early spring they send the cattle up there to pasture and they send with them their saaler women or girls and leave them up there the whole summer long and you can imagine it is a desolate sort of existence. They have a trolley wire that comes from the mountain top to the base upon which they send the milk down from the mountain to be taken to market and also send up stores and provisions for the women who live up there through the summer. They have small farms scattered along through what we might call their valleys and they get the grass off the hillsides. We could hardly recognize it as hay because largely made up of weeds and ferns with possibly a spear or two of grass. They cure their hay in a manner entirely different from anything we see in this country unless we happen to go in sections where Norwegians have settled. They call this method of curing hay "haas." It seems as they took bean poles and planted them two feet apart and connected them with light lumber and put their hay up over this rack until cured, and you can imagine as you pass over the country that these racks present a very curious appearance. They do this partly on account of the small amount of grass in one place but more because of the heavy rains they have and the dews so that the ground is not dry enough most of the season to be able to cure the hay on it. The sun is hot and the hay will cure in a few hours when prepared in the manner described. It is of interest to you to realize that there are 30,000 more Norwegians in the United States than in Norway and because of this fact we find people speaking English through a great many sections of Norway. We often find that the girls have gone over to the United States and then gone back into some of these inland sections and opened a hotel for their fathers on the American plan. We find sometimes the American ways being introduced but not in very many sections and some of the men who drove us spoke of the fact that it was very hard to get a Norwegian to adopt a different system of work from that which they had and if I recollect rightly they told me they began to work at seven o'clock in the morning and then worked for an hour and then left off for an hour and again began at nine o'clock and worked until twelve and then rested for two hours until two o'clock and then worked until five and then stopped until seven and then, as I remember, worked until nine. Maybe that don't count up quite right. They fix the hours to suit themselves. That gives you an idea of the way they perform their day's work instead of going at it and getting through with it as our American man does. The method of transportation is interesting. When I tell you that during the month I was in Norway I was but three times on a steam railway you can realize that we did not travel in a hurry. Most of the travelling is by the stulkjaare. The stulkjaare is a two wheeled cart with a seat in front for two people and be hind a seat for one on which the driver sits. They drive in this the little horses which are native to Norway and weigh from 700 to 800 pounds. They cost in our money about $125.00. The stulkjaare you can purchase from $35 to $40. This is really the earning capacity of the farmer or the implements that he has to use to make his living with.

These little farms that you find through the country sections possibly you could get two and maybe four of them in this room so little are they. You can realize from such a small plot of ground that the farmer cannot make very much to keep his family on; so with his horse and stulkjaare he has something that he can earn a living for his family with and it has been a Godsend to the Norwegian that the tourist has taken to travel in his country more and they do not hesitate to say that their country is much better financially than before the tourist came there in numbers and so it is fair to say that one of the chief industries is catering to tourists and he does this largely with the stulkjaare. He gets about $3 a day for travelling with his horse and for his own wages. The country is subdivided into two sections and each section has its own station where there are a certain number of horses required to be in order to accommodate tourists and I suppose you have already grasped the idea that everything in this section is of the most primitive kind. The farm houses of the Norwegians are nothing but huts with turf roofs on which is placed the turf and you see the grass growing on these turf roofs from eight to ten inches high which presents a rather picturesque appearance. In contrast to this primitiveness we are rather surprised to find that they have a systematized travelling scheme and each farmer is required to send his horse into the various travelling stations so that there shall be a sufficient number to accommodate the tourists as the demand increases. They have this system so well regulated that each man knows exactly over what territory he can drive, the number of miles or killometers he can drive so that one does not interfere and get into the territory of the other, so that there is a perfectly amiable arrangement. We find the country subdivided into sections very much as our states are subdivided into counties and each section has its own customs and costumes. The people in the various sections wear one particular costume, and this makes me think of one of the institute workers who tells a story of how the farmer's wife is abused by having to send to the neighboring town to buy a spring bonnet. The horse was so slow that by the time she got back the styles had changed. This does not effect the Norwegian woman, because the styles never change. They wear the same style of dress in all its details from generation to generation. I have here, which possibly you can see, the dress of the Norwegian girl and the young women and I have also the dress of the man and the boy in the Hardangar section of Norway. I would like to say that the men from the old countries do much more to contribute to the picturesqueness of the country than do our American men by wearing these attractive costumes. We find the young girls wearing a knitted zeyplucoil which goes over the hair; and then we find the next older girls wearing a cap like this and this corresponds with the same costume that I have shown you on this little girl and they wear a red jacket such as I have here. Then when the woman marries she wears a head arrangement something like that and when she becomes an older married woman she wears a black one. I think you American men would be glad if there was some way you could tell the ages of the American women as quickly and nearly as they can in Norway. The bride wears a crown of metal. She wears it of silver or brass if she is fortunate enough to have enough of worldly goods to own such a one; if not, she wears a material that looks something like brass and is interwoven with bright colored strands and this is handed down from generation to generation. She wears such a streamer hanging down from her waist and then when married she wears two. We go into another section of Norway and we find a costume like this. We find this in the Hollingdel section: It is the most beautiful costume to see. The cap I will put on so that you may have a realization of the way they wear them, because the Norwegians seem to understand the ways of coquettishness. We find in Norway most of their implements are wooden and a great many of them are artistic. We find some of their utensils are carved most attractively and one of the wooden things I have here in my hand that represents an old time custom of the Norwegians is a bridal spoon. This is carved out of one solid piece of wood symbolic of the union of the man and woman and at the breakfast feast the groom eats out of the one and the bridge out of the other and it is very beautifully carved out. We find as we go up to the central part of Norway that we come into a more fertile section and we sometimes see agricultural work done in a way that reminds us of what we do in America. We see them gather the hay in much the same way as we do. And farther north we find still a more fertile country. In the northern section we find a great many Laplanders. There are about 30,000 Laps in Norway. About 3,000 of these are sea Laps who are better off financially than are the field Laps. When we went on north and landed at one of their northern towns called Tromsoe we were greeted by a curious lot of people, a dirty set of people and one feels the people should be fumigated or you keep your distance. The women carry their babies much as the Indian does the papoose and they make caps and dolls for sale. The men carve many things out of bone, pipes and knives, paper knives and spoons, and it is a matter of interest that one of the chief industries of the Laplanders is raising and killing reindeer. The meat is really quite palatable and we had the pleasure of eating it but once at it was out of season, therefore tasteless. One of the men said he was going to begin hunting but would not have reindeer meat by the time he got home and I said: "Why not?" and he said: "Because it costs so much that I will sell it before I get home." I have in my hand a spoon. In this spoon are five little rings. Each ring represents 100 reindeer that this man has killed: so for every 100 reindeer he kills he puts one ring in his spoon. I wish I could convey to you some idea of the beauty of the lights of the midnight sun. It is almost impossible to give you any idea of the wonderful lights and colors that the sun produces in that northern section where they have their days lasting two and one-half months and their nights of corresponding length; and in all that twenty-four hours there is no suggestion of darkness. One does not know by the light when it is time to sleep or when it is time to be awake and surely the tourist seems to be infected, as the native seems to be, by spending most of the twenty-four hours where he can see the beauties of nature round about him. The first night that we had on the North Cape summit made almost the greatest impression of any upon my mind, though that was not the grandest exhibition of lights and colors. At 11.30 the sun set and at 12.30 it rose and we saw the lights of the sun set and sun rise side by side in the cycle and it seemed to give me a greater realization of what it meant to realize that the sun did not set in the sections when we got a little farther north. I am going to take the trouble to read a little extract from my diary that may give you a little idea better than I can give it to you now because I wrote this when the freshness of the impression was upon my mind of the lights and colors as they presented themselves to us in that northern section.

I have but ten minutes time longer to speak to you and I am going to leave you with this picture if I have been able to bring one of you to the land of the midnight sun and I just want to tell you before we leave that when we are on the North Cape we started out at 10.30 and we desired to reach the top of the North Cape which was about 100 feet above the mountain so as to see the sun burst, the flash of glory from the top, but we were unfortunate enough to get into a heavy fog just as we reached the top, but sometimes I think that was a blessing that we could see such a wonderful sight as we did from the top of the Cape even if we did not enjoy the glory of the sun. In just about a minute the fog rose just as if a magic hand had drawn the curtain and there below was the land and the islands and our little boat moving around in the sea and beyond and up above was the line of the sun and then just as it lasted a minute it seemed someone gradually pulled the curtain over and there was nothing beneath us at all.

Now let us go quickly into that vast territory of Russia, one of the largest countries in the world and one of the countries in which you find the greatest accummulation of wealth, the wealth of all the churches and palaces and in everything that pertains to the government, but nothing spent upon the common people; nothing even spent in the way of sanitation and no country needs it more than Russia. We cannot help but be impressed with the strange contrast between the luxury provided for royalty and absolutely nothing for the large mass of the common people. I went through their palaces and we saw doors lined with solid gold; we saw hundreds of plates that were worth from $30,000 to $40,000. They had been presented to the Czar by different people, gracious municipalities and various sections of the country and there were numbers and numbers of these in many of the palaces all through Russia. And one thing that seemed to be different or made more impression on my mind was that they took large numbers of peasants through these palaces and these plates I speak of were always placed in large panels and had a red curtain covering them and likewise their gold doors were covered and when the peasants went through they were exceedingly careful that they did not get a glimpse of this wealth that they were glad to show to the tourist. We had the opportunity of seeing the people congregate at the church festival and if I were to describe a Russian costume it would be a conglamoration of color something like this: a green skirt, a yellow apron, a red shirt waist and a pink kerchief. So you can imagine the combination that you see there. They don't seem to appreciate harmony of colors. It is the common people that I am speaking about. The peasant people are the ones that contribute the interest to the tourist, because in the cities we see people just as we are accustomed to see and dressed much as we are accustomed to seeing. We found one thing in the churches, the Greek Church of Russia, which interested us very much and that is their "ipons" which are similar to the painted images we find in the Roman Catholic Church. They are made of gold and silver and inlaid with diamonds and precious stones. We found a great immense amount of wealth put into some of these single ipons and in a procession we were able to see we counted somewhere upwards of 100 ipons carried through the streets, and in Moscow in one of their oldest chapels, the Iberian Chapel, you find an ipon brought many centuries ago from Iberia, which is taken out when sickness or any occasion calls for it and placed on wagons drawn by six horses and taken through the streets to the house where it is desired to come to and in the meantime, of course, a painted copy is put in the chapel and this is supposed to take away the disease or whatever it is that the particular people in the house are afflicted with. It is a matter of interest that this particular ipon is the one that the Czar, who is the head of the Greek Church, and all the dukes and various prominent members of the royal family come first to worship. We find great quantities of the most beautiful, marvelous and precious stones in Russia and we had the privilege of visiting the royal granite works and I have never seen such stones in such quantities as we saw there and the most wonderful carving in stones possible to imagine. In my hand I hold one of the choicest of the Russian Marbles and the tomb of Alexander II, the liberator of Russia, is made of that marble. You will recall that this particular ruler was assassinated in 1888 and you will remember that it was a girl that by throwing a handkerchief to the street gave the signal to the student who threw the bomb and that Alexander was not injured in the throwing of this bomb and he got out of the carriage to see what assistance could be rendered to the injured and the second boom was thrown which fatally injured Alexander, and this is one of the reasons why the Russian common people are held under suppression because of the dreadful assassination of this particular ruler who was doing everything in his power for the people of Russia. And on the spot where Alexander fell they built a memorial chapel and it is one of the most magnificent chapels that it is possible to imagine. This chapel has some of the most expensive ipons in it.

I want to say that in Russia one finds better sleeping car arrangements than we do find in America. While we find some things most primitive in contrast to that, we find everything that caters to wealth there and in the five nights that we rode in the sleeper in Russia we were much better accommodated than if we had been in American sleepers.

The Russian language is a most difficult one to understand. They have so many letters in their words that people cannot understand what they do with them. I hold in my hands the Lord's prayer written in Russian on this and if you would write the Lord's prayer in English in corresponding sized script I think you would find that it would not cover half this space. There is not a word here that bears any resemblance to my Lord's prayer. And when you travel on the streets I want to say that the droskimen and their droski wagons are features that contribute much to the interest of the tourist. These wagons are drawn by horses wearing large wooden collars over their necks from shaft to shaft.—But the Chairman says I cannot take you any further in Russia to-night. (Applause).

The CHAIRMAN: I am sorry we cannot go any farther with this subject but the time has elapsed and we will now take up the next subject on the program, "Farm Sanitation," by Mrs. George E. Monroe, of Dryden, N. Y. I now have the pleasure of introducing Mrs. Monroe to you.

Mrs. Monroe then presented her address as follows:

FARM SANITATION.

By MRS. GEO. E. MONROE, *Dryden, N. Y.*

For many years the Institute effort has been directed toward the care and feeding of the farm animals. Dairymen and poultry men have really succeeded in bringing about great improvements. Recently it has occurred to us that what was good for the animals in the barns, might with profit be applied to the persons living in the farm homes.

The death rate from serious contagious diseases like typhoid fever, tuberculosis and many others, is as high in the country as in the city. This ought not to be.

There are three things necessary to good health. 1st: Fresh air and sunshine; 2nd: pure water; and 3rd:—and this largely depending upon the first two,—keeping the seeds of disease out of our bodies.

Consumption, which causes the death of more persons than does any other disease, needs only for its cure and prevention—pure air and sunshine, with nourishing food; while the dreaded typhoid fever is a water borne disease. During the day more or less fresh air is admitted to our homes from opening doors, but during the night it is too often carefully excluded. Since we spend one-third of our lives in bed, we might with profit increase our contact with fresh air and improve our health without interfering with our comfort. No one enjoys having the wind blow on them through an open window. But by covering the outside of the window with muslin, or covering a wooden frame which fits under the lower sash of the window, one can enjoy fresh air without any discomfort. Ventilation is fresh air without drafts. Try this method of obtaining it. The muslin should be a trifle heavier than cheese cloth. It will not lower the temperature of the room more than two or three degrees. Besides pure air heats easier and pure air remains warm longer than bad air. If the muslin is unbleached it will not wet through. In regard to the water we use for dometic purposes, it is not enough that water should be odorless, colorless and tasteless. It must prove to be pure under the chemists test. Our bodies need large quantities of water inside and out. The body is truly a system of canals, and should be flushed daily. Five pints of water is none too much to drink daily. It is better than pills. Try it.

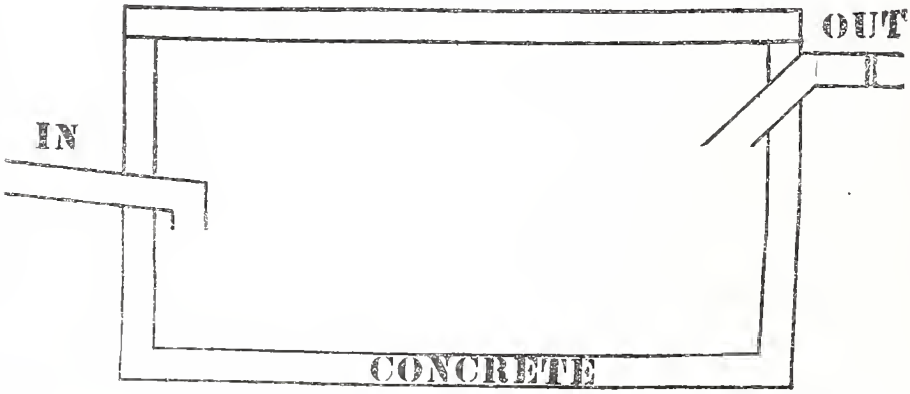
Time was when our country was new, that water from any stream flowing through the farm was safely used for domestic purposes. Now some streams are so foul that fishes cannot live in them. Now the unfortunate dwellers in cities are often obliged to use such water but we on the farms should not do so. A spring in a virgin forest may be pure, but any spring is only as pure as its surroundings. It should be built up with cement at least a foot above the surface of the ground to keep out the surface drainage water. At present the all but universal source of our water supply is some form of well. The dug well, is dug just deep enough to get water, laid up with loose stones or bricks, and covered over with planks which dry and warp in the sun and rain, leaving cracks which admit to the well, surface water, dust and filth which may be near. A dug well should be cemented up inside 6 or 8 feet from the top and a cement cover and curb built to protect it. Probably the safest source of water on the farm is a driven well, deep and well cased to protect it. If there is within 100 feet of any source of filth is contamination there is danger to the water. Slop holes, manure piles, and outside open vaults are a menace if near the water supply.

While seeds of disease are carried into the body by air and water they are also carried by the common house fly. He is called the filthy fly, the typhoid fly. Certain it is he is the most dangerous animal on earth. The more one knows about his habits, the less one likes to speak about him in polite society. He breeds in filth; he lives in filth, and, unfortunately, he eats the same kind of food that we do—but we eat at the second table. He flies back and forth from the slop holes, the manure piles, the outside open closet, into our homes where he alights upon the fruit and food prepared for the farmer's family. He is responsible for the spread of many diseases, consumption, typhoid, bowel diseases of children, and the list is long. Fortunately he never goes very far from the place where he is born, so if we remove all filth from around our homes we will do away with the pest of the house fly.

On many farms it is common to find the water supply for the barns either pumped by windmill or engine or piped from distant springs, but no provision is made to supply the house with water, for bath, toilet or kitchen sink. The farmer is willing but he says, and truly, that there is no sewage system in the country, and he can not dispose of his waste water, and what is the use of putting water in the house if he can not take the sewage out beyond the cellar walls. The old style cesspool, made by digging a pit in the ground and stoning it up without cement, is a menace to health and life, and poisons the soil for long distances. If the water supply comes from a well, it may poison that, the leakage from the ill-smelling, disease harboring outside closet may reach the well water. Even if the surface of the ground slopes right, that is no reason why under ground the water runs right. So you see our homes must be provided with water supply and not depend upon wells. It will cost $100 more or less to put in a system of plumbing, including hot and cold water in the kitchen sink, the permanent bath and the inside closet. The cost depending upon the size of the house and how much help can be given the plumber.

Now the waste waters could be easiest disposed of by turning it into a stream. There is a slight objection to this. It is against the law, and is not allowed unless the State gives permission, this is usually denied. If one small home could and did turn the sewage into a stream others would want to. If the stream is used for domestic purposes further down, the sewage might cause an epidemic of disease. One house might cause 5,000 cases of typhoid. We are too civilized to do this, then what shall we do? We will build a cesspool that will hold all the sewage until it is purified. It should be built in porous soil near the surface of the ground, so the outlet will pass through the first foot of soil, the upper layer of soil being more open and contains more bacteria. The garden is a good place to run the outlet pipe but right under the sod of the lawn is the very best place.

FARM CESS POOL.



6X3X3 FT.

This cesspool will cost about $5 if the farmer can build it himself, and will require 1 load of farm stones, not too large; one load of gravel, not too coarse; and 5 sacks of cement. This builds a cesspool 6 x 3 x 3 feet. and large enough for a family of five or six persons. The cover should be tight, a slab of stone or of cement with seven to nine inches of soil on top, and should not have any ventilating pipe, as the bacteria that work in it are the kind that work without air only. This tank is in effect a settling tank, and can be built of any size, shape or material so long as it is large enough to hold one day's sewage of the family, and so long as the sewage comes in so slowly that the solids have time to settle to the bottom of the tank, it will do all that is expected of it. The tank should be connected to the house by a four inch tile drain, every joint cemented and rubbed smooth on the inside. This should be 24 feet long and have a tilt of one-half inch per foot. It enters half way up the side of the tank. The outlet is at the top of the tank and should be of four inch tile laid with open joints, so the clear water that passes out can pass into the soil at each point. This drain should be from 40 to 80 feet long, depending on soil, laid on a tilt of one thirty-second of an inch per foot. The slanting elbow, on the inside of the tank connected with the outlet, is to keep the scum that forms, in the tank, as in the scum a form of bacteria is working to purify the sewage. The only solid left in this tank is the mineral part, this amounts to very little in a year. It will not freeze so long as the house is occupied. There are two reasons for this: 1st, the character of the water entering the tank; and 2nd, because bacteria in working produce heat. The sewage should not stand in the tank. If the expected flow is cut down, dilute it with water. The water flowing from the outlet is a clear liquid, and is harmless.

A Member: Suppose the air got in the tank would it stop that process?

MRS. MONROE: If you put ventilation in the anarobic bacteria would not work. They are germs that work without air only and change the solids into this clear liquid which passes away through the outlet.

A Member: How many barrels of waste is that supposed to handle?

MRS. MONROE: A tank 6 feet long, 3 feet wide and 3 feet deep is large enough to take care of all the waste from a family of five or six persons. Where there are double that number of persons the tank should be made proportionately larger. It can be made large enough for a whole village to use but on the same plan. On the Scranton water shed there is a system of tanks like this in use. This tank works. It will not fill up. It will not freeze, although it is so near the surface of the ground, because the action of the bacteria gives off heat. You see this on the smoking manure pile on a cold morning. There the ammonia makes the heat.

A Member: What effect does wash day have on this tank?

MRS. MONROE: Not any at all. It takes care of the kitchen sink, the wash tub, the bath and all. It does away with all outside cesspools, outside closets and such things that are a menace to health.

A Member: We have a cesspool on the same principle and our out-take pipe runs for 20 rods and we have an odor there?

MRS. MONROE: Is it a closed pipe?

The Member: No; it runs through a tile pipe; open joints.

MRS. MONROE: Yes.

A Member: Is there any odor left at the end of that?

MRS. MONROE: There should not be.

A Member: We run this into an underdrain and this underdrain was two feet in the ground.

MRS. MONROE: I see; that is too far down and you do not get the action; has not the air.

A Member: I don't see why that should create a smell at the end if that water is pure.

MRS. MONROE: It should not. It must be in the arrangement of your pipes and a certain amount of the solids go out with the outflow.

A Member: May I ask if there is any solid matter left in this tank?

MRS. MONROE: There is. The mineral matter is not acted upon by the bacteria and that amounts to less than one-half inch a year in a tank of this size.

The CHAIRMAN: We will now proceed with the third item on the program for this evening, "A Three Course Dinner," demonstrated with actual cooking, by Mrs. Anna B. Scott, Domestic Science Bureau, Philadelphia, Pa. I suppose you are anxiously awaiting dinner. I have the pleasure of introducing Mrs. Scott.

Mrs. Scott then proceeded with her talk and demonstration as follows:

A THREE COURSE DINNER.

By MRS. ANNA B. SCOTT, *Domestic Science Bureau, Philadelphia, Pa.*

Just a few words about the dinner we are going to cook at a cost of less than 60 cents, for four adults. I hope that every person here will come forward at the close of the demonstration and see the dinner. I only wish that there was enough for all, but I will leave it to a committee to taste, and say whether there is enough for four hungry people.

Yes, housekeeper, we are planning a dinner of well blended and well selected foods; for we want the meal, first, to be satisfying, nutritious and palatable. Second, we want to serve it in the best way to promote the health and pleasure of our family; no haphazard way for us. Just a few touches of refinement at the table mean so much to all. Yes, there are some who think only of filling up, and getting through with the meal; that will do. They are satisfied, and the hunger is appeased. But housekeeper, let us make the dinner table the place that we meet at least once a day, and have a social time.

Following is the menu for the dinner.

Sago Soup;

German Stew with Vegetables and Dumplings;

Creamed Spinach or Cabbage;

Peaches a la Conde.

Sago Soup.

6 cups stock;
½ cup sago;
1 tablespoon finely cut onion;
1 tablespoon finely chopped parsley;
1 teaspoon salt;
Dash white pepper.

We can use rice, barley, or farino in the same way that we are using the sago. Our main thought in having the light soup is to prepare the stomach for the hearty dinner that is to follow.

Remove 6 cups of the stock from the meat that is stewing, add the onion and the sago that has been well washed; boil 30 minutes; then add the salt, pepper, and parsley.

Cost:—Sago, 2c; seasonings, 1c. Total, 3c.

German Stew with Vegetables and Dumplings.

1½ pounds stewing beef;
1 quart potatoes;
1 cup cut carrot;
1½ cup cut onion;
1 tablespoon salt;
Dash white pepper;
1 tablespoon caramel;
1 tablespoon chopped parsley.

Wash or wipe the meat; put on to boil in 2 quarts boiling water; boil slowly 1 hour; remove 6 cups stock for soup; then add to the meat the potatoes, onion, carrot, salt and pepper. Boil 45 minutes or until all is tender, being sure that there is 2 cups stock; if there is not, add boiling water as it is needed. Add the dumplings; boil 10 minutes, without removing the lid. Place the dumplings around the edge of the platter; put the meat and vegetables in the center; add to the gravey the flour which has been mixed with a little cold water, and the caramel. Boil 2 minutes; pour over the meat and dumplings, and sprinkle the chopped parsley over the top.

Dumplings.

1 cup flour;
1 teaspoon baking powder;
1½ teaspoon salt;
1 teaspoon lard.

Sift the flour, salt and baking powder into a bowl; rub in the lard lightly with the tips of the fingers; add just enough cold water to hold the dough together. Take one teaspoonful at a time and roll in floured hands; lay on floured board until all are ready, then put in the meat.

Cost:—Meat, 21c; potatoes, 4c; dumplings, 3½c; seasonings, 1c. Total, 29½c.

Creamed Spinach, or Creamed Cabbage.

I had planned, this morning, to have creamed spinach, but as I went to several places and could not get real nice spinach we are going to have creamed cabbage. If I had been here yesterday I know that I should have been able to get nice spinach as Lancaster has good markets. But this same thing might happen to any housekeeper; after planning to have spinach, she finds that spinach is not to be had, so she gets the next best thing, that does not cost more than spinach. I looked around and all that I could see was a small head of cabbage. Of course you can substitute anything. There are nice string beans, news peas, and nice asparagus. But my thought is to bring you something that you can have 9 months in the year at small cost.

1 small head cabbage;
1 tablespoon butter;
1 tablespoon flour;
1 cup milk;
1 teaspoon salt;
Dash white pepper;
½ teaspoon onion juice or ¼ teaspoon mace.

Cut the cabbage into small pieces; set aside in cold water 30 minutes; drain, put over fire with boiling water enough to cover. Boil 30 minutes without a cover, or until the cabbage is tender. That all depends on the age of the cabbage. Drain, add the sauce and boil 2 minutes.

Cream Sauce.

Put the butter into a sauce pan; when melted add the flour, then the cold milk slowly; stir until smooth and creamy; add the salt, pepper and onion juice or mace. Boil 2 minutes.

Cost:—Cabbage, 5c; butter, 3c; milk, 2c. Total, 10c.

Peaches a la Conde.

1 cup rice;
½ cup sugar;
2 cups peaches, cherries, strawberries, (either fresh or canned; fresh are best);
½ teaspoon salt;
1 teaspoon butter.

Wash the rice through several waters; put on with 4 quarts boiling water. Boil 25 minutes; strain; drain; blanch with boiling water; sprinkle with salt and spread on a platter or bake dish which has been brushed with melted butter; spread the fruit over the rice;

sprinkle the sugar over the fruit and place in hot oven 10 minutes. This is served with a sauce made as follows, or you can serve it with fruit juice, or with cream.

Sauce.

1 cup water;
1 cup peach juice;
2 tablespoons sugar;
1 tablespoon cornstarch;
1 tablespoon lemon juice.

As soon as the water comes to a boil add the cornstarch which has been mixed with a little cold water; boil 2 minutes then add the sugar, peach juice, and lemon juice.

Cost:—Rice, 4c; peaches, 10c; other ingredients, 1½c. Total, 15c.

Total cost of dinner:

Soup,	$ .03
Meat,	.29½
Cabbage,	.10
Dessert,	.15½
	$ .58

The CHAIRMAN: This completes our program for the evening and this will be the closing session of the institute. If there are no further remarks or business this Institute will stand adjourned.

A. L. MARTIN,
Director of Institutes.